

## Calibration Factors And Time-and-Distance Guidelines For Use of Theatrical Fog Equipment

Bog Fog, K-razy Haze, Training Smoke XD,  
Backwood Bay, Faze Haze, Training Smoke  
FR, Amusement Park Fluid, Velocity, Cryo  
Freeze, Quick Blast, Training Smoke Q,  
Techno Fog, Beam Splitter, Neutronic Haze,  
DaFiddy, Base-H

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# 1 Introduction

In 1997-99, at the request of Actors' Equity Association (AEA) and the League of American Theaters and Producers (LATP) and with the support of the Equity-League Pension and Health Trust Funds, investigators from the Mount Sinai School of Medicine (Mt. Sinai) and ENVIRON International Corporation (ENVIRON) conducted a study to evaluate whether the use of smoke, fog, haze, and pyrotechnics special effects in theatrical musical productions is associated with a negative health impact in actors. This effort was initiated in response to ongoing concerns by actors that the use of these theatrical effects may have an impact on their health. The results of this study were presented in the report *Health Effects Evaluation of Theatrical Smoke, Haze, and Pyrotechnics* (Mt. Sinai and ENVIRON 2000).

The results of the Mt. Sinai/ENVIRON study indicate that there are certain health effects associated with actors exposed to elevated or peak levels of glycol smoke/fog and mineral oil. However, as long as peak exposures are avoided, actors' health, vocal abilities, and careers should not be harmed. Pyrotechnics as used on Broadway at the time of the study did not have an observable effect on actors' health.

Mt. Sinai and ENVIRON recommended the following peak guidance levels with respect to glycols and mineral oil:

- The use of glycols should be such that an actor's exposure does not exceed **40 milligrams per cubic meter (mg/m<sup>3</sup>)**.
- Mineral oil should be used in a manner such that an actor's exposure does not exceed a peak concentration of **25 mg/m<sup>3</sup>**.
- For chronic exposures to mineral oil, the existing standards established for oil mists (**5 mg/m<sup>3</sup>** as an eight-hour time-weighted average) should also be protective for actors in theatrical productions.

Comparable guidance levels were developed for glycerol in a subsequent study (ENVIRON 2001b):

- Glycerol should be used in a manner such that an actor's exposure does not exceed a peak concentration of **50 mg/m<sup>3</sup>**.
- For chronic exposures to glycerol, the existing standards established for glycerin mists (**10 mg/m<sup>3</sup>** as an eight-hour TWA) should also be protective for actors in theatrical productions.

To ensure that peak smoke, fog, and haze levels are below these guidelines, one option available to productions is to conduct show-specific testing at their theatres using an aerosol monitor. In order to conduct this testing, calibration data must be developed for each equipment/fluid combination. These calibration data are necessary to convert the readings of the aerosol monitor to glycol, mineral oil, or glycerol concentrations. A compilation of calibration factors approved for use in evaluating compliance with the peak guidance levels is provided on the Actors Equity web site (<http://www.actorsequity.org/library/library.asp?cat=33>).

ENVIRON was retained by Froggy's Fog to develop calibration factors and time-and-distance guidelines for the following equipment-fluid combinations listed in Appendix A.

## 2 Testing Methodology

### 2.1 Sampling Equipment and Materials

Monitoring of short-term concentrations was performed using portable real-time aerosol monitors (*personal* DataRAM Model PDR-1000) manufactured by Thermo Scientific. The PDR-1000 is a high sensitivity (i.e., photometric) monitor that uses a light scattering sensing chamber to measure the concentration of airborne particulate matter (liquid or solid), providing a direct and continuous readout as well as electronic logging of the data.

The PDR-1000 aerosol monitors as obtained are calibrated to Arizona road dust over a measurement range of 0.001 to 400 mg/m<sup>3</sup>. In order to be utilized to measure short-term glycol, oil mist, or glycerol concentrations, the monitors were first calibrated for the smoke or haze machines and fluids being used. Calibration of the aerosol monitors was conducted by collecting simultaneous measurements with a series of sampling pumps and PDR-1000 aerosol monitors, mounted on tripods.

Gilian BDx-II and Gilian GilAir 3 sampling pumps were used to draw air through collection media. The calibration sampling was conducted in conjunction with operating the PDR-1000 aerosol monitor.

For fluids containing glycols, OSHA Versatile Sampler (OVS) traps were used as the collection media, each containing two sections of XAD-7 resin (200-mg front section, 100-mg back section, separated by a polyurethane foam [PUF] plug). The XAD-7 resin was used to collect both the particulate and vapor phase of the glycol aerosol. A 13-mm glass fiber filter (GFF) plug precedes the front section and a PUF plug follows the back section. This sampling is based on a variation of NIOSH Method 5523 (NIOSH 1996; Pendergrass 1999). Bulk fluid samples are also collected and submitted for laboratory analysis to determine which species of glycols are present.

For fluids containing glycerols, air samples were collected on 37 mm 2-piece cassettes containing tared 5µm polyvinyl chloride (PVC) filters. The sampling method is based on NIOSH Method 0500.

For fluids containing mineral oil, air samples were collected on 37 mm 2-piece cassettes containing tared 5µm polyvinyl chloride (PVC) filters. Bulk fluid samples are also collected and submitted for laboratory analysis to be used as a calibration standard. The sampling method is based on NIOSH Method 5026.

The testing was performed at a rented industrial space in Columbia, Tennessee.

### 2.2 Aerosol Monitor Calibration Procedure

A series of tripod assemblies was used for calibrating the aerosol monitors, each consisting of a sampling pump, flexible tubing, sampling media, and an aerosol monitor. The height of the tripod was approximately five feet, corresponding with the breathing zone of a typical actor. For low fog machines, testing assemblies were placed at floor level. The room ventilation fans were

turned off during each run; no major movement occurred in the testing room during each run that would affect fog dispersion.

- a. The sampling pumps were calibrated to 2 liters per minute (LPM) (OVS traps) or 3 LPM (cassettes) using a BIOS Defender pump calibrator. The aerosol monitor was zeroed, the data logging function of the aerosol monitor was turned on, and the data logging time for the aerosol monitors were synchronized.
- b. The fog machines were positioned on a table to allow a release of fog at a height of four feet. Low fog machines and the Martin K-1 hazer were positioned on the floor. The tripods were placed at various distances from the smoke machine release nozzle to achieve a range of exposure concentrations.
- c. The sampling pumps were turned on, followed by the fog machines, allowing sustained fog generation to occur. After a period of approximately five to twenty minutes, the machines and pumps were simultaneously turned off.
- d. The sampling media were capped and labeled to identify the type of fog machine and fluid, sampling location, and other sampling specifics. After being capped and labeled, OVS traps were placed in a freezer.
- e. Various fans and ceiling vents were used between runs to clear residual aerosols from the testing area air by room ventilation.

The collection media and bulk fluid samples, along with appropriate field blanks, were submitted for analysis to Analytics Laboratory of Richmond, Virginia, an American Industrial Hygiene Association (AIHA) accredited laboratory.

### **2.3 Laboratory Analysis**

All sample analyses were conducted by using validated analytical methodologies, as described in the ENVIRON Air Sampling Protocol (ENVIRON 2001a).

Samples were analyzed for glycols using a variation of NIOSH Method 5523, which involves the use of a gas chromatograph with a flame ionization detector (GC/FID). The NIOSH Method 5523 was extended to a validated level of quantification (LOQ) of 5.0 to 15.0 micrograms ( $\mu\text{g}$ ) of each individual glycol per sample.

Samples were analyzed gravimetrically for glycerols using NIOSH Method 0500. A LOQ of 10  $\mu\text{g}$  per sample was used.

Samples were analyzed by infrared spectrophotometry for mineral oil using NIOSH Method 5026. A LOQ of 50  $\mu\text{g}$  per sample was used.

### **2.4 Time-and-Distance Monitoring Procedure**

To measure the levels of glycol, glycerol, or mineral oil present at different distances from the release point, a series of five tripods equipped with aerosol monitors positioned at breathing height (approximately 5 ft above ground) were used. Each fog or haze machine was turned on for durations ranging from 5 to 120 seconds, allowing sustained fog generation to occur, and

then turned off. The aerosol monitors collected logged data on the fog levels as the concentrations gradually dissipated. For low fog machines, tripods were also placed at various heights off of the floor at a set distance from the smoke machine to represent breathing heights of actors in various positions (e.g. lying down, sitting, kneeling, and standing).

### 3 Results and Discussion

#### 3.1 Aerosol Monitor Calibration

Total glycol, glycerol, and mineral oil concentrations were calculated from the analytical data. For glycols, only the glycol species measured in the bulk solution were included. For glycol species that were measured in the bulk solution, and were detected in the air sample but not above the LOQ, one half of the LOQ for that glycol species was conservatively used in calculating the total glycol concentration. To develop a calibration curve for each fluid, the average aerosol monitor readings during the period of time in which air was drawn through the sampling media for each air sample were calculated and plotted against the total glycol, glycerol, or mineral oil concentration data.

The calibration curves for the fifty equipment-fluid combinations tested are shown in Appendix C. First order regression curves are also shown on these figures. The calibration factors, calculated from the slopes of these regressions, are summarized in Appendix B.

For determining the calibration factor for any fluid containing two or more distinct chemical constituents, the calibration factors were initially determined for each constituent, and the most conservative calibration factor was used when conducting time and distance testing for the fluid as a whole.

#### 3.2 Use of Calibration Factors

The real-time aerosol monitor readings can be converted to glycol concentrations using the appropriate calibration factor for the fluid, as follows:

$$CONC = C \times PDR$$

where:

*CONC* = air concentration of total glycols, mg/m<sup>3</sup>

*C* = aerosol monitor calibration factor (mg/m<sup>3</sup>)/ (mg/m<sup>3</sup> aerosol)

*PDR* = aerosol monitor reading, mg/m<sup>3</sup> aerosol

For example, an uncalibrated reading of 100 mg/m<sup>3</sup> on the aerosol monitor would correspond to a glycol concentration of 107 mg/m<sup>3</sup> for the Chauvet 1800 Flex/Bog Fog combination. These calculated concentrations can then be compared with the peak guidance levels. The peak guidance level for glycols of 40 mg/m<sup>3</sup> would correspond to an uncalibrated aerosol monitor reading of 37.4 mg/m<sup>3</sup> for the Chauvet 1800 Flex/Bog Fog combination.

#### 3.3 Time-and-Distance Guidelines

For various distances from the cue release point, Appendix C provides the average time (in seconds) after the end of the cue release after which the glycol, glycerol, or oil mist concentrations will have fallen below the guidance levels. Thus, in order to prevent peak exposures to actors, the blocking and choreography should be arranged such that actors are not situated within a particular distance from the front of the fog release point until the amount of



time listed in Appendix C has elapsed following the end of the cue. For example, if a production is using the Chauvet 1800 Flex/Bog Fog combination at full output with 15-second cue duration, an actor should not be situated within five to 25 feet from the front of the cue release point until at least 70 seconds following the end of the cue release.

It should be reiterated that the Time-and-Distance Guidelines provided in Appendix C are intended to allow a production to use the tested equipment and fluid combinations without conducting monitoring. However, these Guidelines may not be appropriate for all productions. Tables in Appendix C are based on the fog machine being positioned approximately four feet above the ground, and being operated to achieve 5 to 120 seconds of continuous fog generation. Productions may want to use different configurations for positioning the machine (e.g., different heights), provide on-stage ventilation, or generate fog for a shorter or longer period of time. In addition, many productions may have other stage-specific conditions (e.g., on-stage activities and props that enhance dispersion) that would allow actors to be present in areas that are restricted under these Guidelines but which, in fact, do not exceed the guidance levels. In those cases, production-specific monitoring would be recommended to determine whether peak exposure may occur.

## 4 References

- ENVIRON International Corporation (ENVIRON). 2001a. Evaluation of short-term exposures to theatrical smoke and haze: Air sampling protocol. Prepared for Equity-League Pension and Health Trust Funds. May 14.
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- National Institute for Occupational Safety and Health (NIOSH). 1996. Method 5523: Glycols, Issue 1. NIOSH Manual of Analytical Methods (NMAM). Fourth Edition. May 15.
- Pendergrass, S.M. 1999. Determination of glycols in air: Development of sampling and analytical methodology and application to theatrical smokes. AIHA Journal, 60:452-457.

## **Appendix A: Equipment/Fluid Combinations**

### Appendix A: Equipment/Fluid Combinations

<b>Machine</b>	<b>Fluid</b>
ADJ Fog Fury 3000	Backwood Bay
ADJ Fog Fury 3000	Bog Fog
ADJ Fog Fury 3000	Cryo Freeze
ADJ Fog Fury 3000	Quick Blast
ADJ Fog Fury 3000	Velocity
ADJ Fog Storm 1700 HD	Cryo Freeze
ADJ Fog Storm 1700 HD	Quick Blast
ADJ Fog Storm 1700 HD	Velocity
Antari 1520 RGB Upshot	Quick Blast
Antari DNG-200	Cryo Freeze
Antari F-5/F-5D Fazer	Faze Haze
Antari ICE	Cryo Freeze
Antari M-10	Bog Fog
Antari M-10	Cryo Freeze
Antari M-10	Quick Blast
Antari M-10	Velocity
Antari M-5	Amusement Park Fluid
Antari M-5	Backwood Bay
Antari M-5	Bog Fog
Antari M-5	Cryo Freeze
Antari M-5	Quick Blast
Antari M-5	Velocity
Antari M-8	Amusement Park Fluid
Antari M-8	Backwood Bay
Antari M-8	Bog Fog
Antari M-8	Cryo Freeze
Antari M-8	Quick Blast
Antari M-8	Velocity
Antari X-515	Amusement Park Fluid
Antari X-515	Backwood Bay
Antari X-515	Bog Fog
Antari X-515	Cryo Freeze
Antari X-515	Quick Blast
Antari X-515	Velocity
Antari Z-350	Beam Splitter
BHE 1550	Amusement Park Fluid
BHE 1550	Backwood Bay
BHE 1550	Bog Fog
BHE 1550	Cryo Freeze
BHE 1550	Quick Blast
BHE 1550	Velocity
Chauvet 1800 Flex	Amusement Park Fluid
Chauvet 1800 Flex	Backwood Bay
Chauvet 1800 Flex	Bog Fog
Chauvet 1800 Flex	Cryo Freeze

<b>Machine</b>	<b>Fluid</b>
Chauvet 1800 Flex	Quick Blast
Chauvet 1800 Flex	Techno
Chauvet 1800 Flex	Velocity
Chauvet AmHaze II	Faze Haze
Chauvet Geysler	Quick Blast
FireBase SG-1300	Training Smoke FR
FireBase SG-1300	Training Smoke Q
FireBase SG-1300	Training Smoke XD
FireBase SG-2600	Training Smoke FR
FireBase SG-2600	Training Smoke XD
FireBase SG-M1500	Training Smoke FR
FireBase SG-M1500	Training Smoke Q
FireBase SG-M1500	Training Smoke XD
FireBase SG-M1800	Training Smoke FR
FireBase SG-M1800	Training Smoke Q
FireBase SG-M1800	Training Smoke XD
FireBase SG-M3000	Training Smoke Q
FireBase SG-M3000	Training Smoke XD
hazebase Base Classic	Amusement Park Fluid
hazebase Base Classic	Backwood Bay
hazebase Base Classic	Bog Fog
hazebase Base Classic	Cryo Freeze
hazebase Base Classic	Quick Blast
hazebase Base Classic	Velocity
hazebase Base Hazer Pro	base hazer liquid
hazebase Base Hazer Pro	Faze Haze
hazebase High Power 220V	Backwood Bay
hazebase High Power 220V	Bog Fog
LeMaitre MVS	Neutronic Haze
LeMaitre Neutron XS	Neutronic Haze
Martin K-1	K-razy Haze
Martin Magnum 2000	Backwood Bay
Martin Magnum 2000	Bog Fog
Martin Magnum 2000	Cryo Freeze
Martin Magnum 2000	Quick Blast
Martin Magnum 2000	Velocity
Martin ZR-33	Cryo Freeze
Martin ZR-33	Quick Blast
Martin ZR-33	Velocity
Martin ZR-44	Backwood Bay
Martin ZR-44	Bog Fog
Martin ZR-44	Cryo Freeze
Martin ZR-44	Quick Blast
Martin ZR-44	Velocity
Reel EFX DF-50 Diffusion Hazer	DaFiddy
Robe Fog 1550 FT	Amusement Park Fluid

<b>Machine</b>	<b>Fluid</b>
Robe Fog 1550 FT	Backwood Bay
Robe Fog 1550 FT	Bog Fog
Robe Fog 1550 FT	Cryo Freeze
Robe Fog 1550 FT	Quick Blast
Robe Fog 1550 FT	Velocity
Ultratec G3000	Amusement Park Fluid
Ultratec G3000	Backwood Bay
Ultratec G3000	Bog Fog
Ultratec G3000	Cryo Freeze
Ultratec G3000	Quick Blast
Ultratec G3000	Velocity
Ultratec Radiance Hazer	Neutronic Haze

## **Appendix B: Calibration Factors**

**Appendix B: Calibration Factors**

<b>Machine</b>	<b>Fluid</b>	<b>Calibration Factor</b>
ADJ Fog Fury 3000	Backwood Bay	0.39
ADJ Fog Fury 3000	Bog Fog	1.62
ADJ Fog Fury 3000	Cryo Freeze	0.64
ADJ Fog Fury 3000	Quick Blast	0.64
ADJ Fog Fury 3000	Velocity	0.64
ADJ Fog Storm 1700 HD	Cryo Freeze	2.67
ADJ Fog Storm 1700 HD	Quick Blast	2.67
ADJ Fog Storm 1700 HD	Velocity	2.67
Antari 1520 RGB Upshot	Quick Blast	1.28
Antari DNG-200	Cryo Freeze	4.99
Antari F-5/F-5D Fazer	Faze Haze	0.69
Antari ICE	Cryo Freeze	2.54
Antari M-10	Bog Fog	2.62
Antari M-10	Cryo Freeze	2.46
Antari M-10	Quick Blast	2.46
Antari M-10	Velocity	2.46
Antari M-5	Amusement Park Fluid	1.41
Antari M-5	Backwood Bay	1.41
Antari M-5	Bog Fog	1.03
Antari M-5	Cryo Freeze	1.74
Antari M-5	Quick Blast	1.74
Antari M-5	Velocity	1.74
Antari M-8	Amusement Park Fluid	1.35
Antari M-8	Backwood Bay	1.35
Antari M-8	Bog Fog	1.29
Antari M-8	Cryo Freeze	2.65
Antari M-8	Quick Blast	2.65
Antari M-8	Velocity	2.65
Antari X-515	Amusement Park Fluid	1.07
Antari X-515	Backwood Bay	1.07
Antari X-515	Bog Fog	1.43
Antari X-515	Cryo Freeze	1.74
Antari X-515	Quick Blast	1.74
Antari X-515	Velocity	1.74
Antari Z-350	Beam Splitter	1.90
BHE 1550	Amusement Park Fluid	1.07
BHE 1550	Backwood Bay	1.07
BHE 1550	Bog Fog	1.43
BHE 1550	Cryo Freeze	1.74
BHE 1550	Quick Blast	1.74
BHE 1550	Velocity	1.74
Chauvet 1800 Flex	Amusement Park Fluid	1.00
Chauvet 1800 Flex	Backwood Bay	1.00
Chauvet 1800 Flex	Bog Fog	1.07
Chauvet 1800 Flex	Cryo Freeze	0.76



<b>Machine</b>	<b>Fluid</b>	<b>Calibration Factor</b>
Chauvet 1800 Flex	Quick Blast	0.76
Chauvet 1800 Flex	Techno	2.94
Chauvet 1800 Flex	Velocity	0.76
Chauvet AmHaze II	Faze Haze	0.83
Chauvet Geyser	Quick Blast	1.62
FireBase SG-1300	Training Smoke FR	0.58
FireBase SG-1300	Training Smoke Q	1.69
FireBase SG-1300	Training Smoke XD	0.86
FireBase SG-2600	Training Smoke FR	0.99
FireBase SG-2600	Training Smoke XD	3.11
FireBase SG-M1500	Training Smoke FR	1.07
FireBase SG-M1500	Training Smoke Q	1.74
FireBase SG-M1500	Training Smoke XD	1.43
FireBase SG-M1800	Training Smoke FR	1.35
FireBase SG-M1800	Training Smoke Q	2.65
FireBase SG-M1800	Training Smoke XD	1.29
FireBase SG-M3000	Training Smoke Q	2.46
FireBase SG-M3000	Training Smoke XD	2.62
hazebase Base Classic	Amusement Park Fluid	0.58
hazebase Base Classic	Backwood Bay	0.58
hazebase Base Classic	Bog Fog	0.86
hazebase Base Classic	Cryo Freeze	1.69
hazebase Base Classic	Quick Blast	1.69
hazebase Base Classic	Velocity	1.69
hazebase Base Hazer Pro	base hazer liquid	0.43
hazebase Base Hazer Pro	Faze Haze	0.76
hazebase High Power 220V	Backwood Bay	0.99
hazebase High Power 220V	Bog Fog	3.11
LeMaitre MVS	Neutronic Haze	0.35
LeMaitre Neutron XS	Neutronic Haze	0.09
Martin K-1	K-razy Haze	0.49
Martin Magnum 2000	Backwood Bay	0.93
Martin Magnum 2000	Bog Fog	1.21
Martin Magnum 2000	Cryo Freeze	1.01
Martin Magnum 2000	Quick Blast	1.01
Martin Magnum 2000	Velocity	1.01
Martin ZR-33	Cryo Freeze	2.20
Martin ZR-33	Quick Blast	2.20
Martin ZR-33	Velocity	2.20
Martin ZR-44	Backwood Bay	0.77
Martin ZR-44	Bog Fog	1.40
Martin ZR-44	Cryo Freeze	0.95
Martin ZR-44	Quick Blast	0.95
Martin ZR-44	Velocity	0.95
Reel EFX DF-50 Diffusion Hazer	DaFiddy	0.40
Robe Fog 1550 FT	Amusement Park Fluid	1.07

<b>Machine</b>	<b>Fluid</b>	<b>Calibration Factor</b>
Robe Fog 1550 FT	Backwood Bay	1.07
Robe Fog 1550 FT	Bog Fog	1.43
Robe Fog 1550 FT	Cryo Freeze	1.74
Robe Fog 1550 FT	Quick Blast	1.74
Robe Fog 1550 FT	Velocity	1.74
Ultratec G3000	Amusement Park Fluid	1.07
Ultratec G3000	Backwood Bay	1.07
Ultratec G3000	Bog Fog	0.88
Ultratec G3000	Cryo Freeze	2.96
Ultratec G3000	Quick Blast	2.96
Ultratec G3000	Velocity	2.96
Ultratec Radiance Hazer	Neutronic Haze	1.06

**Appendix C:  
Calibration Factor and Time and Distance  
Testing Results for Each Equipment/Fluid  
Combination**



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# Calibration Factor and Time-and-Distance Guidelines

## American DJ (ADJ) Fog Fury 3000 with Backwood Bay Fluid

Prepared for Froggy's Fog by ENVIRON International Corporation

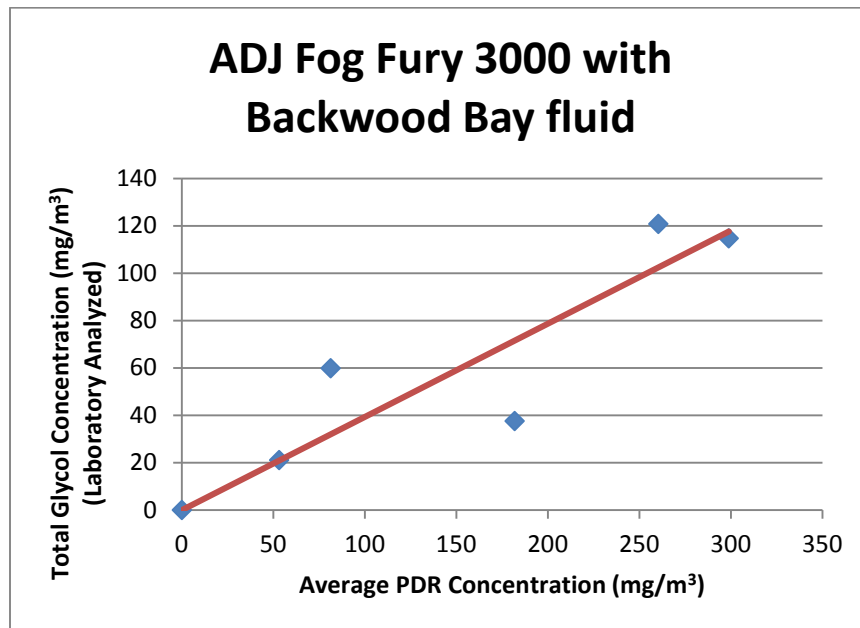
ENVIRON developed calibration factors and Time-and-Distance guidelines for the use of Froggy's Fog Backwood Bay fluid in an ADJ Fog Fury 3000 fog generator.

Backwood Bay is a glycol-based fog fluid. Calibration factors were developed to allow a Thermo Scientific PDR-1000 aerosol monitor to be used to measure concentrations glycols in the air after being released from the Fog Fury 3000.

The measured concentrations should be compared against the peak exposure guidance level for glycols, which is 40 mg/m<sup>3</sup>.



The calibration curve for glycols is shown below:



**Figure 1.** Calibration curve for ADJ Fog Fury 3000 with Backwood Bay fluid, based on glycol laboratory data. Calibration factor, based on slope of curve, is 0.39 (mg/m<sup>3</sup> glycol) / (mg/m<sup>3</sup> aerosol).

Summary of Calibration Factor				
Manufacturer	Machine	Fluid	Fluid Type	Calibration Factor
ADJ	Fog Fury 3000	Backwood Bay	Glycol	0.39

**Time and Distance Guidelines.** For various distances from the cue release point, the following table provides the average time (in seconds) after the end of the cue release after which the glycol concentrations will have fallen below the guidance levels. Thus, in order to prevent peak exposures to actors, the blocking and choreography should be arranged such that actors are not situated within a particular distance from the front of the fog release point until the amount of time listed in this table has elapsed following the end of the cue. For example, if a production is using the ADJ Fog Fury 3000/Backwood Bay combination at full output with 15-second cue duration, an actor should not be situated within five feet from the front of the cue release point until at least 50 seconds following the end of the cue release.

Summary of Time-and-Distance Guidelines for Fog Generation ADJ Fog Fury 3000 with Backwood Bay Fluid						
Release Duration (secs)	Time (in sec) After Which Air Concentrations Are Below Guidance Level (40 mg/m <sup>3</sup> )					
	Machine Setting	5 ft	10 ft	15 ft	20 ft	25 ft
5	Full	50	40	40	40	30
15*	Full	50	40	40	40	30

\*Machine does not run continuously for longer than 17 seconds

It should be reiterated that the Time-and-Distance Guidelines provided above are intended to allow a production to use the tested equipment and fluid combinations without conducting monitoring. However, these Guidelines may not be appropriate for all productions. Productions may want to use different configurations for positioning the machine (e.g., different heights), provide on-stage ventilation, or generate fog for a shorter or longer period of time. In addition, many productions may have other stage-specific conditions (e.g., on-stage activities and props that enhance dispersion) that would allow actors to be present in areas that are restricted under these Guidelines but which, in fact, do not exceed the guidance levels. In those cases, production-specific monitoring would be recommended to evaluate whether peak exposure may occur.





## Calibration Factor and Time-and-Distance Guidelines

### American DJ (ADJ) Fog Fury 3000 with Bog Fog Fluid

Prepared for Froggy's Fog by ENVIRON International Corporation

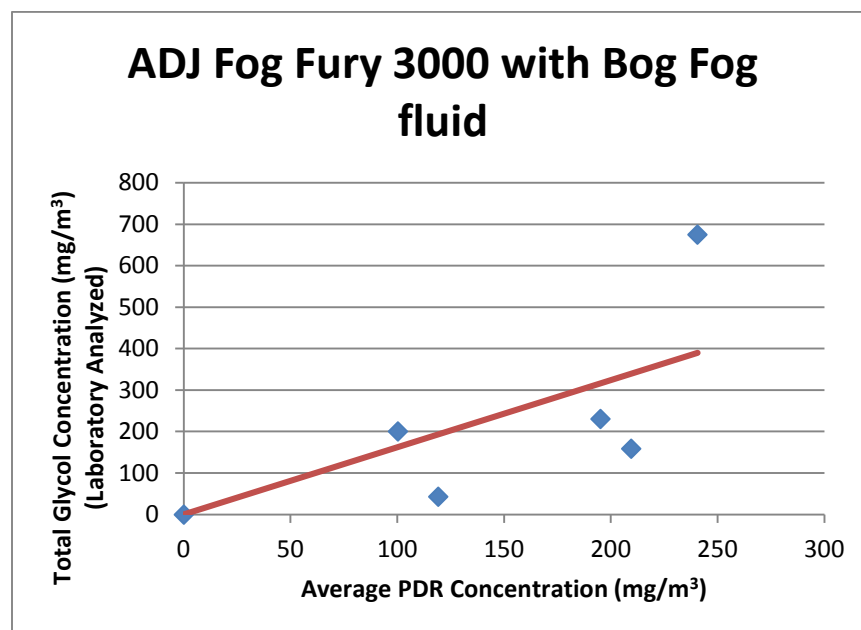
ENVIRON developed calibration factors and Time-and-Distance guidelines for the use of Froggy's Fog Bog Fog fluid in an ADJ Fog Fury 3000 fog generator.

Bog Fog is a glycol-based fog fluid. Calibration factors were developed to allow a Thermo Scientific PDR-1000 aerosol monitor to be used to measure concentrations glycols in the air after being released from the Fog Fury 3000.

The measured concentrations should be compared against the peak exposure guidance level for glycols, which is 40 mg/m<sup>3</sup>.



The calibration curve for glycols is shown below:



**Figure 1.** Calibration curve for ADJ Fog Fury 3000 with Bog Fog fluid, based on glycol laboratory data. Calibration factor, based on slope of curve, is 1.62 (mg/m<sup>3</sup> glycol) / (mg/m<sup>3</sup> aerosol).

Summary of Calibration Factor				
Manufacturer	Machine	Fluid	Fluid Type	Calibration Factor
ADJ	Fog Fury 3000	Bog Fog	Glycol	1.62

**Time and Distance Guidelines.** For various distances from the cue release point, the following table provides the average time (in seconds) after the end of the cue release after which the glycol concentrations will have fallen below the guidance levels. Thus, in order to prevent peak exposures to actors, the blocking and choreography should be arranged such that actors are not situated within a particular distance from the front of the fog release point until the amount of time listed in this table has elapsed following the end of the cue. For example, if a production is using the ADJ Fog Fury 3000/Bog Fog combination at full output with 15-second cue duration, an actor should not be situated within five to 15 feet from the front of the cue release point until at least 130 seconds following the end of the cue release.

Summary of Time-and-Distance Guidelines for Fog Generation ADJ Fog Fury 3000 with Bog Fog Fluid						
Release Duration (secs)	Time (in sec) After Which Air Concentrations Are Below Guidance Level (40 mg/m <sup>3</sup> )					
	Machine Setting	5 ft	10 ft	15 ft	20 ft	25 ft
5	Full	80	60	40	0	0
15*	Full	130	130	130	40	30

\*Machine does not run continuously for longer than 17 seconds

It should be reiterated that the Time-and-Distance Guidelines provided above are intended to allow a production to use the tested equipment and fluid combinations without conducting monitoring. However, these Guidelines may not be appropriate for all productions. Productions may want to use different configurations for positioning the machine (e.g., different heights), provide on-stage ventilation, or generate fog for a shorter or longer period of time. In addition, many productions may have other stage-specific conditions (e.g., on-stage activities and props that enhance dispersion) that would allow actors to be present in areas that are restricted under these Guidelines but which, in fact, do not exceed the guidance levels. In those cases, production-specific monitoring would be recommended to evaluate whether peak exposure may occur.



# Calibration Factor and Time-and-Distance Guidelines

## American DJ (ADJ) Fog Fury 3000 with Velocity Fluid

Prepared for Froggy's Fog by ENVIRON International Corporation

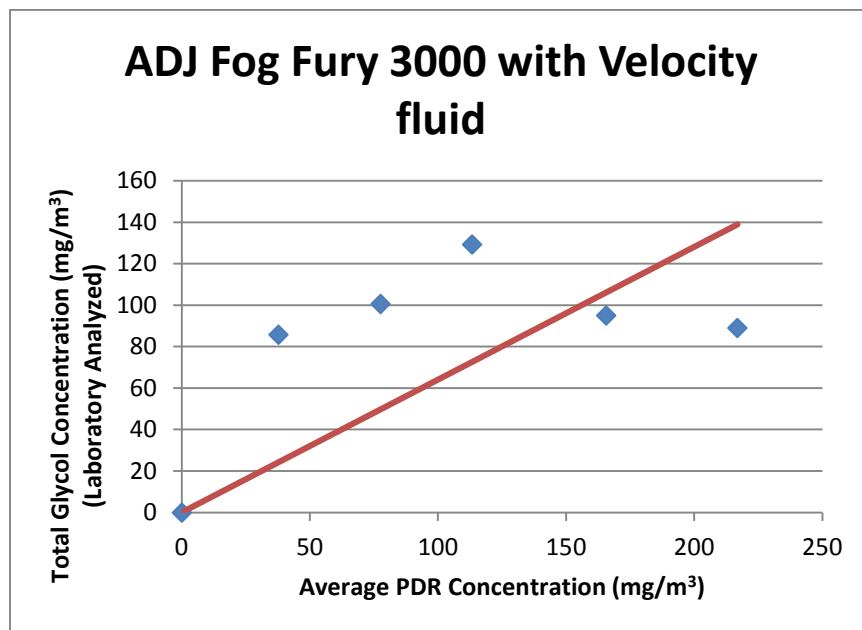
ENVIRON developed calibration factors and Time-and-Distance guidelines for the use of Froggy's Fog Velocity fluid in an ADJ Fog Fury 3000 fog generator.

Velocity is a glycol-based fog fluid. Calibration factors were developed to allow a Thermo Scientific PDR-1000 aerosol monitor to be used to measure concentrations glycols in the air after being released from the Fog Fury 3000.

The measured concentrations should be compared against the peak exposure guidance level for glycols, which is 40 mg/m<sup>3</sup>.



The calibration curve for glycols is shown below:



**Figure 1.** Calibration curve for ADJ Fog Fury 3000 with Velocity fluid, based on glycol laboratory data. Calibration factor, based on slope of curve, is 0.64 (mg/m<sup>3</sup> glycol) / (mg/m<sup>3</sup> aerosol).

Summary of Calibration Factor				
Manufacturer	Machine	Fluid	Fluid Type	Calibration Factor
ADJ	Fog Fury 3000	Velocity	Glycol	0.64

**Time and Distance Guidelines.** For various distances from the cue release point, the following table provides the average time (in seconds) after the end of the cue release after which the glycol concentrations will have fallen below the guidance levels. Thus, in order to prevent peak exposures to actors, the blocking and choreography should be arranged such that actors are not situated within a particular distance from the front of the fog release point until the amount of time listed in this table has elapsed following the end of the cue. For example, if a production is using the ADJ Fog Fury 3000/Velocity combination at full output with 15-second cue duration, an actor should not be situated within five to 15 feet from the front of the cue release point until at least 30 seconds following the end of the cue release.

Summary of Time-and-Distance Guidelines for Fog Generation ADJ Fog Fury 3000 with Velocity Fluid						
Release Duration (secs)	Time (in sec) After Which Air Concentrations Are Below Guidance Level (40 mg/m <sup>3</sup> )					
	Machine Setting	5 ft	10 ft	15 ft	20 ft	25 ft
5	Full	20	20	0	0	0
15*	Full	30	30	30	0	0

\*Machine does not run continuously for longer than 17 seconds

It should be reiterated that the Time-and-Distance Guidelines provided above are intended to allow a production to use the tested equipment and fluid combinations without conducting monitoring. However, these Guidelines may not be appropriate for all productions. Productions may want to use different configurations for positioning the machine (e.g., different heights), provide on-stage ventilation, or generate fog for a shorter or longer period of time. In addition, many productions may have other stage-specific conditions (e.g., on-stage activities and props that enhance dispersion) that would allow actors to be present in areas that are restricted under these Guidelines but which, in fact, do not exceed the guidance levels. In those cases, production-specific monitoring would be recommended to evaluate whether peak exposure may occur.



## Calibration Factor and Time-and-Distance Guidelines

### American DJ (ADJ) Fog Fury 3000 with Cryo Freeze Fluid

Prepared for Froggy's Fog by ENVIRON International Corporation

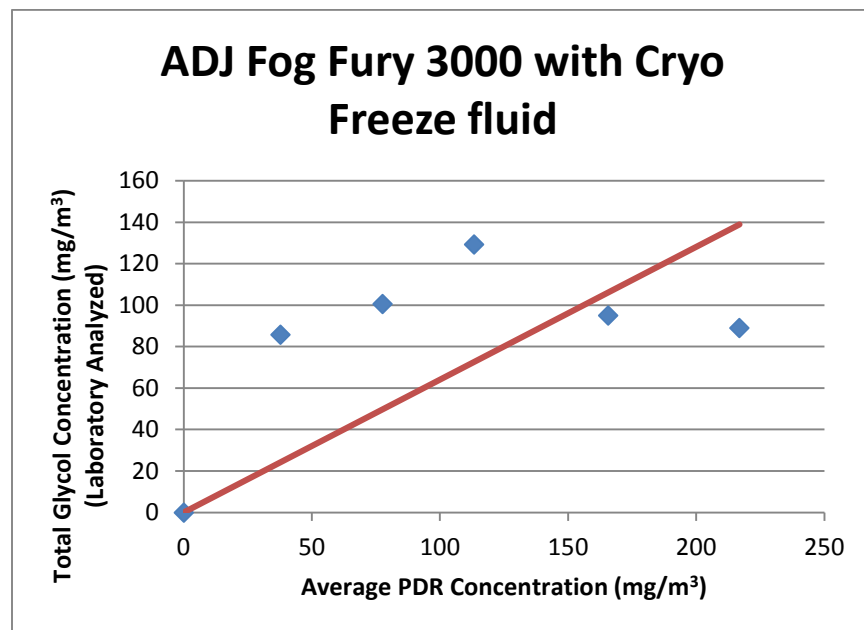
ENVIRON developed calibration factors and Time-and-Distance guidelines for the use of Froggy's Fog Cryo Freeze fluid in an ADJ Fog Fury 3000 fog generator.

Cryo Freeze is a glycol-based fog fluid. Calibration factors were developed to allow a Thermo Scientific PDR-1000 aerosol monitor to be used to measure concentrations glycols in the air after being released from the Fog Fury 3000.

The measured concentrations should be compared against the peak exposure guidance level for glycols, which is 40 mg/m<sup>3</sup>.



The calibration curve for glycols is shown below:



**Figure 1.** Calibration curve for ADJ Fog Fury 3000 with Cryo Freeze fluid, based on glycol laboratory data. Calibration factor, based on slope of curve, is 0.64 (mg/m<sup>3</sup> glycol) / (mg/m<sup>3</sup> aerosol).

Summary of Calibration Factor				
Manufacturer	Machine	Fluid	Fluid Type	Calibration Factor
ADJ	Fog Fury 3000	Cryo Freeze	Glycol	0.64

**Time and Distance Guidelines.** For various distances from the cue release point, the following table provides the average time (in seconds) after the end of the cue release after which the glycol concentrations will have fallen below the guidance levels. Thus, in order to prevent peak exposures to actors, the blocking and choreography should be arranged such that actors are not situated within a particular distance from the front of the fog release point until the amount of time listed in this table has elapsed following the end of the cue. For example, if a production is using the ADJ Fog Fury 3000/Cryo Freeze combination at full output with 15-second cue duration, an actor should not be situated within five to 15 feet from the front of the cue release point until at least 30 seconds following the end of the cue release.

Summary of Time-and-Distance Guidelines for Fog Generation ADJ Fog Fury 3000 with Cryo Freeze Fluid						
Release Duration (secs)	Time (in sec) After Which Air Concentrations Are Below Guidance Level (40 mg/m <sup>3</sup> )					
	Machine Setting	5 ft	10 ft	15 ft	20 ft	25 ft
5	Full	20	20	0	0	0
15*	Full	30	30	30	0	0

\*Machine does not run continuously for longer than 17 seconds

It should be reiterated that the Time-and-Distance Guidelines provided above are intended to allow a production to use the tested equipment and fluid combinations without conducting monitoring. However, these Guidelines may not be appropriate for all productions. Productions may want to use different configurations for positioning the machine (e.g., different heights), provide on-stage ventilation, or generate fog for a shorter or longer period of time. In addition, many productions may have other stage-specific conditions (e.g., on-stage activities and props that enhance dispersion) that would allow actors to be present in areas that are restricted under these Guidelines but which, in fact, do not exceed the guidance levels. In those cases, production-specific monitoring would be recommended to evaluate whether peak exposure may occur.



## Calibration Factor and Time-and-Distance Guidelines

### American DJ (ADJ) Fog Fury 3000 with Quick Blast Fluid

Prepared for Froggy's Fog by ENVIRON International Corporation

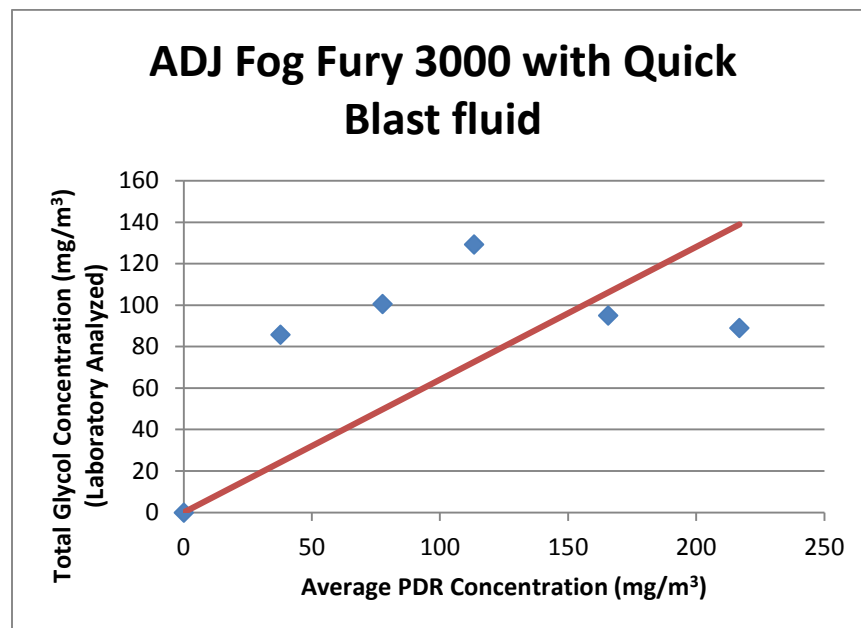
ENVIRON developed calibration factors and Time-and-Distance guidelines for the use of Froggy's Fog Quick Blast fluid in an ADJ Fog Fury 3000 fog generator.

Quick Blast is a glycol-based fog fluid. Calibration factors were developed to allow a Thermo Scientific PDR-1000 aerosol monitor to be used to measure concentrations glycols in the air after being released from the Fog Fury 3000.

The measured concentrations should be compared against the peak exposure guidance level for glycols, which is 40 mg/m<sup>3</sup>.



The calibration curve for glycols is shown below:



**Figure 1.** Calibration curve for ADJ Fog Fury 3000 with Quick Blast fluid, based on glycol laboratory data. Calibration factor, based on slope of curve, is 0.64 (mg/m<sup>3</sup> glycol) / (mg/m<sup>3</sup> aerosol).

Summary of Calibration Factor				
Manufacturer	Machine	Fluid	Fluid Type	Calibration Factor
ADJ	Fog Fury 3000	Quick Blast	Glycol	0.64

**Time and Distance Guidelines.** For various distances from the cue release point, the following table provides the average time (in seconds) after the end of the cue release after which the glycol concentrations will have fallen below the guidance levels. Thus, in order to prevent peak exposures to actors, the blocking and choreography should be arranged such that actors are not situated within a particular distance from the front of the fog release point until the amount of time listed in this table has elapsed following the end of the cue. For example, if a production is using the ADJ Fog Fury 3000/Quick Blast combination at full output with 15-second cue duration, an actor should not be situated within five to 15 feet from the front of the cue release point until at least 30 seconds following the end of the cue release.

Summary of Time-and-Distance Guidelines for Fog Generation ADJ Fog Fury 3000 with Quick Blast Fluid						
Release Duration (secs)	Time (in sec) After Which Air Concentrations Are Below Guidance Level (40 mg/m <sup>3</sup> )					
	Machine Setting	5 ft	10 ft	15 ft	20 ft	25 ft
5	Full	20	20	0	0	0
15*	Full	30	30	30	0	0

\*Machine does not run continuously for longer than 17 seconds

It should be reiterated that the Time-and-Distance Guidelines provided above are intended to allow a production to use the tested equipment and fluid combinations without conducting monitoring. However, these Guidelines may not be appropriate for all productions. Productions may want to use different configurations for positioning the machine (e.g., different heights), provide on-stage ventilation, or generate fog for a shorter or longer period of time. In addition, many productions may have other stage-specific conditions (e.g., on-stage activities and props that enhance dispersion) that would allow actors to be present in areas that are restricted under these Guidelines but which, in fact, do not exceed the guidance levels. In those cases, production-specific monitoring would be recommended to evaluate whether peak exposure may occur.





## Calibration Factor and Time-and-Distance Guidelines

### American DJ (ADJ) Fog Storm 1700 HD with Velocity Fluid

Prepared for Froggy's Fog by ENVIRON International Corporation

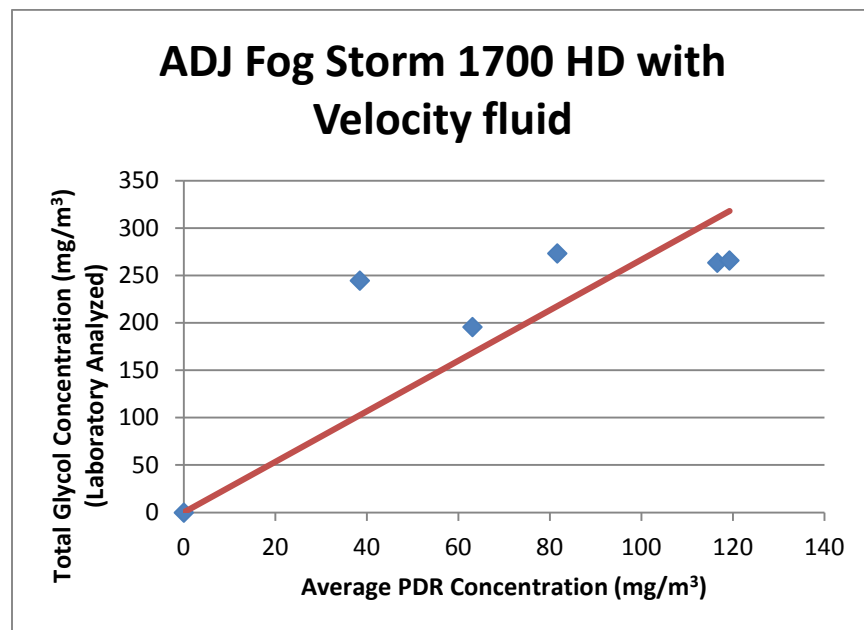
ENVIRON developed calibration factors and Time-and-Distance guidelines for the use of Froggy's Fog Velocity fluid in an ADJ Fog Storm 1700 HD fog generator.

Velocity is a glycol-based fog fluid. Calibration factors were developed to allow a Thermo Scientific PDR-1000 aerosol monitor to be used to measure concentrations glycols in the air after being released from the Fog Storm 1700 HD.

The measured concentrations should be compared against the peak exposure guidance level for glycols, which is  $40 \text{ mg/m}^3$ .



The calibration curve for glycols is shown below:



**Figure 1.** Calibration curve for ADJ Fog Storm 1700 HD with Velocity fluid, based on glycol laboratory data. Calibration factor, based on slope of curve, is  $2.67 \text{ (mg/m}^3 \text{ glycol) / (mg/m}^3 \text{ aerosol)}$ .

Summary of Calibration Factor				
Manufacturer	Machine	Fluid	Fluid Type	Calibration Factor
ADJ	Fog Storm 1700 HD	Velocity	Glycol	2.67

**Time and Distance Guidelines.** For various distances from the cue release point, the following table provides the average time (in seconds) after the end of the cue release after which the glycol concentrations will have fallen below the guidance levels. Thus, in order to prevent peak exposures to actors, the blocking and choreography should be arranged such that actors are not situated within a particular distance from the front of the fog release point until the amount of time listed in this table has elapsed following the end of the cue. For example, if a production is using the ADJ Fog Storm 1700 HD/Velocity combination at full output with 15-second cue duration, an actor should not be situated within five to 20 feet from the front of the cue release point until at least 20 seconds following the end of the cue release.

Summary of Time-and-Distance Guidelines for Fog Generation ADJ Fog Storm 1700 HD with Velocity Fluid						
Release Duration (secs)	Output Setting	Time (in sec) After Which Air Concentrations Are Below Guidance Level (40 mg/m <sup>3</sup> )				
		5 ft	10 ft	15 ft	20 ft	25 ft
5	Full	20	10	10	0	0
15	Full	20	20	20	20	0
30*	Full	20	20	20	20	0

Pump in machine was not factory-issued. Performance may vary from factory-issued machine.

\*Machine does not run continuously for longer than 30 seconds.

It should be reiterated that the Time-and-Distance Guidelines provided above are intended to allow a production to use the tested equipment and fluid combinations without conducting monitoring. However, these Guidelines may not be appropriate for all productions. Productions may want to use different configurations for positioning the machine (e.g., different heights), provide on-stage ventilation, or generate fog for a shorter or longer period of time. In addition, many productions may have other stage-specific conditions (e.g., on-stage activities and props that enhance dispersion) that would allow actors to be present in areas that are restricted under these Guidelines but which, in fact, do not exceed the guidance levels. In those cases, production-specific monitoring would be recommended to evaluate whether peak exposure may occur.



## Calibration Factor and Time-and-Distance Guidelines

### American DJ (ADJ) Fog Storm 1700 HD with Cryo Freeze Fluid

Prepared for Froggy's Fog by ENVIRON International Corporation

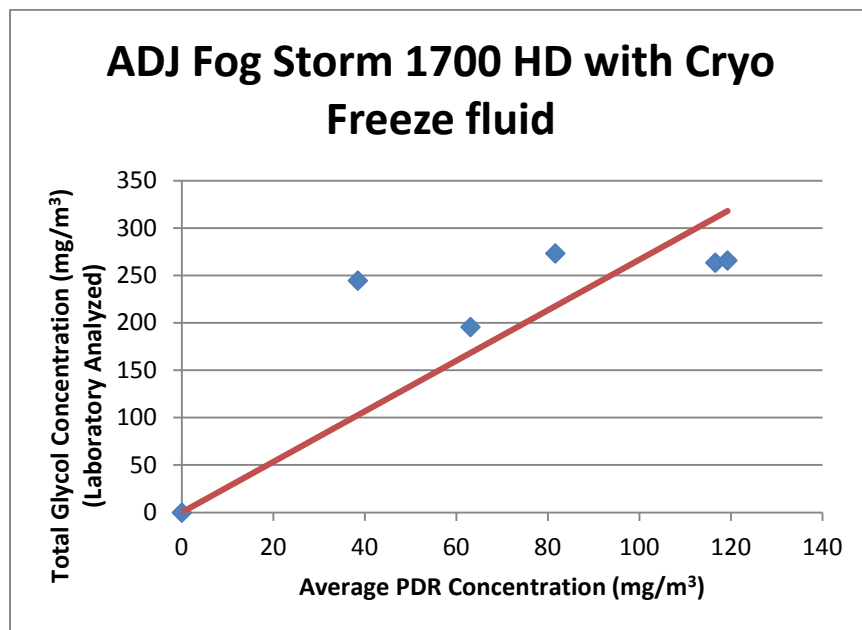
ENVIRON developed calibration factors and Time-and-Distance guidelines for the use of Froggy's Fog Cryo Freeze fluid in an ADJ Fog Storm 1700 HD fog generator.

Cryo Freeze is a glycol-based fog fluid. Calibration factors were developed to allow a Thermo Scientific PDR-1000 aerosol monitor to be used to measure concentrations glycols in the air after being released from the Fog Storm 1700 HD.

The measured concentrations should be compared against the peak exposure guidance level for glycols, which is 40 mg/m<sup>3</sup>.



The calibration curve for glycols is shown below:



**Figure 1.** Calibration curve for ADJ Fog Storm 1700 HD with Cryo Freeze fluid, based on glycol laboratory data. Calibration factor, based on slope of curve, is 2.67 (mg/m<sup>3</sup> glycol) / (mg/m<sup>3</sup> aerosol).

Summary of Calibration Factor				
Manufacturer	Machine	Fluid	Fluid Type	Calibration Factor
ADJ	Fog Storm 1700 HD	Cryo Freeze	Glycol	2.67

**Time and Distance Guidelines.** For various distances from the cue release point, the following table provides the average time (in seconds) after the end of the cue release after which the glycol concentrations will have fallen below the guidance levels. Thus, in order to prevent peak exposures to actors, the blocking and choreography should be arranged such that actors are not situated within a particular distance from the front of the fog release point until the amount of time listed in this table has elapsed following the end of the cue. For example, if a production is using the ADJ Fog Storm 1700 HD/Cryo Freeze combination at full output with 15-second cue duration, an actor should not be situated within five to 20 feet from the front of the cue release point until at least 20 seconds following the end of the cue release.

Summary of Time-and-Distance Guidelines for Fog Generation ADJ Fog Storm 1700 HD with Cryo Freeze Fluid						
Release Duration (secs)	Output Setting	Time (in sec) After Which Air Concentrations Are Below Guidance Level (40 mg/m <sup>3</sup> )				
		5 ft	10 ft	15 ft	20 ft	25 ft
5	Full	20	10	10	0	0
15	Full	20	20	20	20	0
30*	Full	20	20	20	20	0

Pump in machine was not factory-issued. Performance may vary from factory-issued machine.

\*Machine does not run continuously for longer than 30 seconds.

It should be reiterated that the Time-and-Distance Guidelines provided above are intended to allow a production to use the tested equipment and fluid combinations without conducting monitoring. However, these Guidelines may not be appropriate for all productions. Productions may want to use different configurations for positioning the machine (e.g., different heights), provide on-stage ventilation, or generate fog for a shorter or longer period of time. In addition, many productions may have other stage-specific conditions (e.g., on-stage activities and props that enhance dispersion) that would allow actors to be present in areas that are restricted under these Guidelines but which, in fact, do not exceed the guidance levels. In those cases, production-specific monitoring would be recommended to evaluate whether peak exposure may occur.



## Calibration Factor and Time-and-Distance Guidelines

### American DJ (ADJ) Fog Storm 1700 HD with Quick Blast Fluid

Prepared for Froggy's Fog by ENVIRON International Corporation

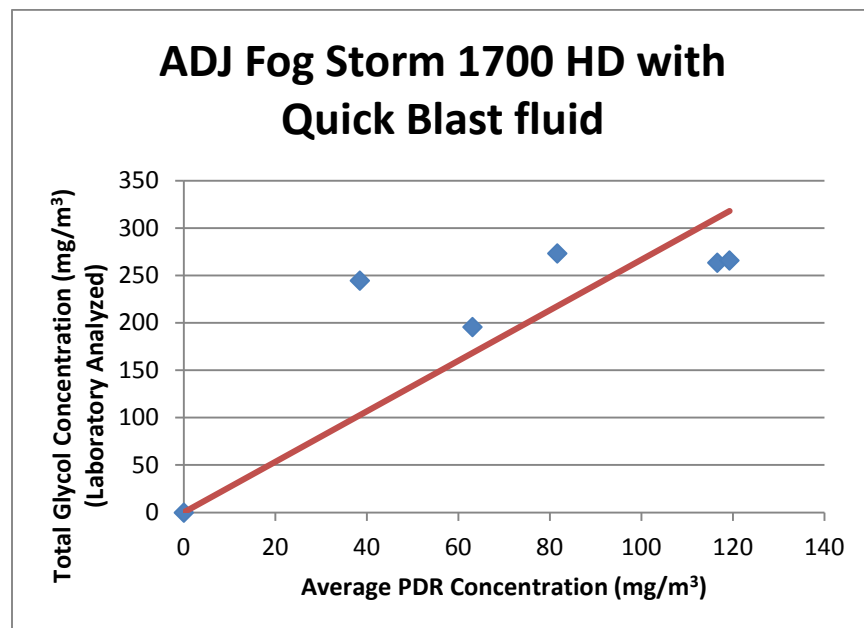
ENVIRON developed calibration factors and Time-and-Distance guidelines for the use of Froggy's Fog Quick Blast fluid in an ADJ Fog Storm 1700 HD fog generator.

Quick Blast is a glycol-based fog fluid. Calibration factors were developed to allow a Thermo Scientific PDR-1000 aerosol monitor to be used to measure concentrations glycols in the air after being released from the Fog Storm 1700 HD.

The measured concentrations should be compared against the peak exposure guidance level for glycols, which is  $40 \text{ mg/m}^3$ .



The calibration curve for glycols is shown below:



**Figure 1.** Calibration curve for ADJ Fog Storm 1700 HD with Quick Blast fluid, based on glycol laboratory data. Calibration factor, based on slope of curve, is  $2.67 \text{ (mg/m}^3 \text{ glycol) / (mg/m}^3 \text{ aerosol)}$ .

Summary of Calibration Factor				
Manufacturer	Machine	Fluid	Fluid Type	Calibration Factor
ADJ	Fog Storm 1700 HD	Quick Blast	Glycol	2.67

**Time and Distance Guidelines.** For various distances from the cue release point, the following table provides the average time (in seconds) after the end of the cue release after which the glycol concentrations will have fallen below the guidance levels. Thus, in order to prevent peak exposures to actors, the blocking and choreography should be arranged such that actors are not situated within a particular distance from the front of the fog release point until the amount of time listed in this table has elapsed following the end of the cue. For example, if a production is using the ADJ Fog Storm 1700 HD/Quick Blast combination at full output with 15-second cue duration, an actor should not be situated within five to 20 feet from the front of the cue release point until at least 20 seconds following the end of the cue release.

Summary of Time-and-Distance Guidelines for Fog Generation ADJ Fog Storm 1700 HD with Quick Blast Fluid						
Release Duration (secs)	Output Setting	Time (in sec) After Which Air Concentrations Are Below Guidance Level (40 mg/m <sup>3</sup> )				
		5 ft	10 ft	15 ft	20 ft	25 ft
5	Full	20	10	10	0	0
15	Full	20	20	20	20	0
30*	Full	20	20	20	20	0

Pump in machine was not factory-issued. Performance may vary from factory-issued machine.

\*Machine does not run continuously for longer than 30 seconds.

It should be reiterated that the Time-and-Distance Guidelines provided above are intended to allow a production to use the tested equipment and fluid combinations without conducting monitoring. However, these Guidelines may not be appropriate for all productions. Productions may want to use different configurations for positioning the machine (e.g., different heights), provide on-stage ventilation, or generate fog for a shorter or longer period of time. In addition, many productions may have other stage-specific conditions (e.g., on-stage activities and props that enhance dispersion) that would allow actors to be present in areas that are restricted under these Guidelines but which, in fact, do not exceed the guidance levels. In those cases, production-specific monitoring would be recommended to evaluate whether peak exposure may occur.



## Calibration Factor and Time-and-Distance Guidelines

### Antari M-5 with Backwood Bay Fluid

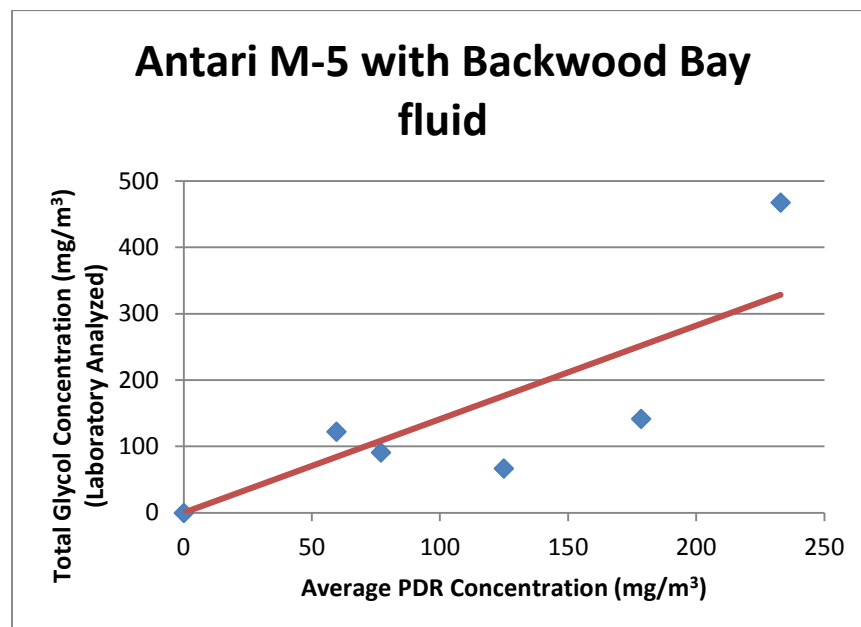
Prepared for Froggy's Fog by ENVIRON International Corporation

ENVIRON developed calibration factors and Time-and-Distance guidelines for the use of Froggy's Fog Backwood Bay fluid in an Antari M-5 fog generator.

Backwood Bay is a glycol-based fog fluid. Calibration factors were developed to allow a Thermo Scientific PDR-1000 aerosol monitor to be used to measure concentrations glycols in the air after being released from the M-5.

The measured concentrations should be compared against the peak exposure guidance level for glycols, which is 40 mg/m<sup>3</sup>.

The calibration curve for glycols is shown below:



**Figure 1.** Calibration curve for Antari M-5 with Backwood Bay fluid, based on glycol laboratory data. Calibration factor, based on slope of curve, is 1.41 (mg/m<sup>3</sup> glycol) / (mg/m<sup>3</sup> aerosol).

Summary of Calibration Factor				
Manufacturer	Machine	Fluid	Fluid Type	Calibration Factor
Antari	M-5	Backwood Bay	Glycol	1.41

**Time and Distance Guidelines.** For various distances from the cue release point, the following table provides the average time (in seconds) after the end of the cue release after which the glycol concentrations will have fallen below the guidance levels. Thus, in order to prevent peak exposures to actors, the blocking and choreography should be arranged such that actors are not situated within a particular distance from the front of the fog release point until the amount of time listed in this table has elapsed following the end of the cue. For example, if a production is using the Antari M-5/Backwood Bay combination at 100% output with 15-second cue duration, an actor should not be situated within five to 25 feet from the front of the cue release point until at least 90 seconds following the end of the cue release.

Summary of Time-and-Distance Guidelines for Fog Generation Antari M-5 with Backwood Bay Fluid						
Release Duration (secs)	Time (in sec) After Which Air Concentrations Are Below Guidance Level (40 mg/m <sup>3</sup> )					
	Machine Setting	5 ft	10 ft	15 ft	20 ft	25 ft
5	100%	90	90	90	90	90
15	100%	90	90	90	90	90
30*	100%	90	90	90	90	90
30†	65%	60	60	60	50	0
60†	65%	70	70	60	50	10
60	25%	50	0	0	0	0

\*Machine shuts off after 20 seconds

†Machine runs at reduced output volume after 15 seconds

It should be reiterated that the Time-and-Distance Guidelines provided above are intended to allow a production to use the tested equipment and fluid combinations without conducting monitoring. However, these Guidelines may not be appropriate for all productions. Productions may want to use different configurations for positioning the machine (e.g., different heights), provide on-stage ventilation, or generate fog for a shorter or longer period of time. In addition, many productions may have other stage-specific conditions (e.g., on-stage activities and props that enhance dispersion) that would allow actors to be present in areas that are restricted under these Guidelines but which, in fact, do not exceed the guidance levels. In those cases, production-specific monitoring would be recommended to evaluate whether peak exposure may occur.





# Calibration Factor and Time-and-Distance Guidelines

## Antari M-5 with Amusement Park Fluid

Prepared for Froggy's Fog by ENVIRON International Corporation

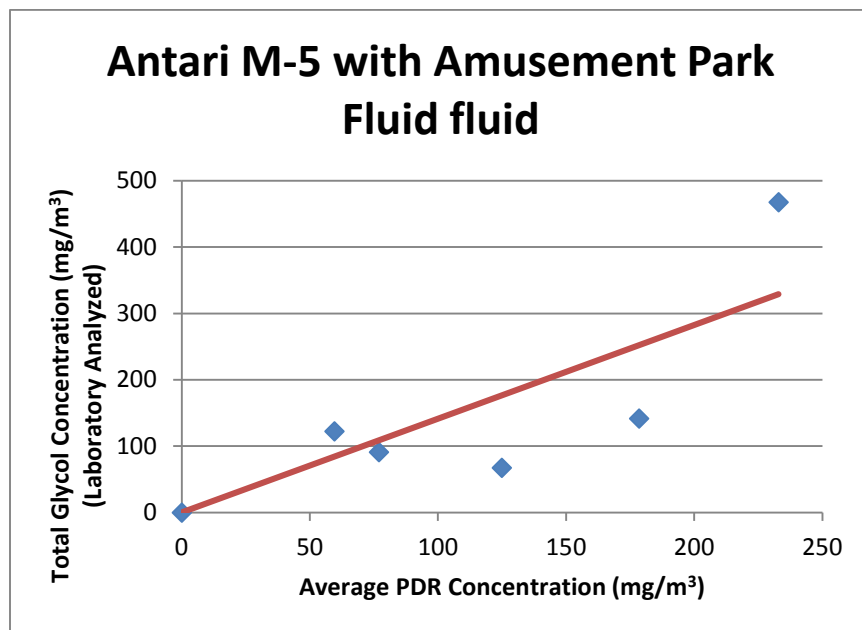
ENVIRON developed calibration factors and Time-and-Distance guidelines for the use of Froggy's Fog Amusement Park Fluid in an Antari M-5 fog generator.

Amusement Park Fluid is a glycol-based fog fluid. Calibration factors were developed to allow a Thermo Scientific PDR-1000 aerosol monitor to be used to measure concentrations glycols in the air after being released from the M-5.

The measured concentrations should be compared against the peak exposure guidance level for glycols, which is 40 mg/m<sup>3</sup>.



The calibration curve for glycols is shown below:



**Figure 1.** Calibration curve for Antari M-5 with Amusement Park Fluid, based on glycol laboratory data. Calibration factor, based on slope of curve, is 1.41 (mg/m<sup>3</sup> glycol) / (mg/m<sup>3</sup> aerosol).

Summary of Calibration Factor				
Manufacturer	Machine	Fluid	Fluid Type	Calibration Factor
Antari	M-5	Amusement Park Fluid	Glycol	1.41

**Time and Distance Guidelines.** For various distances from the cue release point, the following table provides the average time (in seconds) after the end of the cue release after which the glycol concentrations will have fallen below the guidance levels. Thus, in order to prevent peak exposures to actors, the blocking and choreography should be arranged such that actors are not situated within a particular distance from the front of the fog release point until the amount of time listed in this table has elapsed following the end of the cue. For example, if a production is using the Antari M-5/Amusement Park Fluid combination at 100% output with 15-second cue duration, an actor should not be situated within five to 25 feet from the front of the cue release point until at least 90 seconds following the end of the cue release.

Summary of Time-and-Distance Guidelines for Fog Generation Antari M-5 with Amusement Park Fluid						
Release Duration (secs)	Time (in sec) After Which Air Concentrations Are Below Guidance Level (40 mg/m <sup>3</sup> )					
	Machine Setting	5 ft	10 ft	15 ft	20 ft	25 ft
5	100%	90	90	90	90	90
15	100%	90	90	90	90	90
30*	100%	90	90	90	90	90
30†	65%	60	60	60	50	0
60†	65%	70	70	60	50	10
60	25%	50	0	0	0	0

\*Machine shuts off after 20 seconds

†Machine runs at reduced output volume after 15 seconds

It should be reiterated that the Time-and-Distance Guidelines provided above are intended to allow a production to use the tested equipment and fluid combinations without conducting monitoring. However, these Guidelines may not be appropriate for all productions. Productions may want to use different configurations for positioning the machine (e.g., different heights), provide on-stage ventilation, or generate fog for a shorter or longer period of time. In addition, many productions may have other stage-specific conditions (e.g., on-stage activities and props that enhance dispersion) that would allow actors to be present in areas that are restricted under these Guidelines but which, in fact, do not exceed the guidance levels. In those cases, production-specific monitoring would be recommended to evaluate whether peak exposure may occur.



## Calibration Factor and Time-and-Distance Guidelines

### Antari M-5 with Bog Fog Fluid

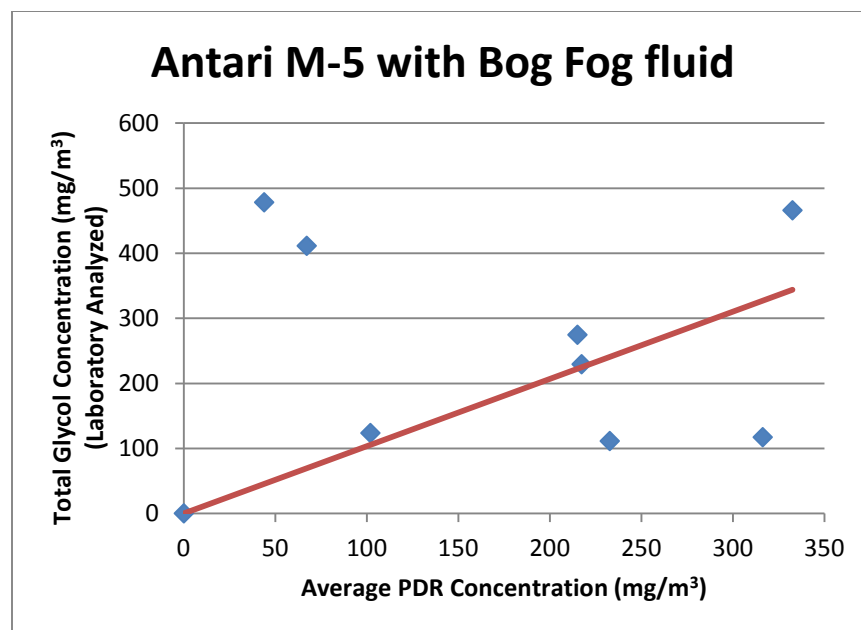
Prepared for Froggy's Fog by ENVIRON International Corporation

ENVIRON developed calibration factors and Time-and-Distance guidelines for the use of Froggy's Fog Bog Fog fluid in an Antari M-5 fog generator.

Bog Fog is a glycol-based fog fluid. Calibration factors were developed to allow a Thermo Scientific PDR-1000 aerosol monitor to be used to measure concentrations glycols in the air after being released from the M-5.

The measured concentrations should be compared against the peak exposure guidance level for glycols, which is 40 mg/m<sup>3</sup>.

The calibration curve for glycols is shown below:



**Figure 1.** Calibration curve for Antari M-5 with Bog Fog fluid, based on glycol laboratory data. Calibration factor, based on slope of curve, is 1.03 (mg/m<sup>3</sup> glycol) / (mg/m<sup>3</sup> aerosol).

Summary of Calibration Factor				
Manufacturer	Machine	Fluid	Fluid Type	Calibration Factor
Antari	M-5	Bog Fog	Glycol	1.03

**Time and Distance Guidelines.** For various distances from the cue release point, the following table provides the average time (in seconds) after the end of the cue release after which the glycol concentrations will have fallen below the guidance levels. Thus, in order to prevent peak exposures to actors, the blocking and choreography should be arranged such that actors are not situated within a particular distance from the front of the fog release point until the amount of time listed in this table has elapsed following the end of the cue. For example, if a production is using the Antari M-5/Bog Fog combination at 100% output with 15-second cue duration, an actor should not be situated within five to 10 feet from the front of the cue release point until at least 90 seconds following the end of the cue release.

Summary of Time-and-Distance Guidelines for Fog Generation Antari M-5 with Bog Fog Fluid						
Release Duration (secs)	Time (in sec) After Which Air Concentrations Are Below Guidance Level (40 mg/m <sup>3</sup> )					
	Machine Setting	5 ft	10 ft	15 ft	20 ft	25 ft
5	100%	90	90	50	30	0
15	100%	90	90	60	60	60
30	100%	100	100	60	60	60
30	65%	100	30	0	0	0
60	65%	110	40	0	0	0
60	25%	110	0	0	0	0

It should be reiterated that the Time-and-Distance Guidelines provided above are intended to allow a production to use the tested equipment and fluid combinations without conducting monitoring. However, these Guidelines may not be appropriate for all productions. Productions may want to use different configurations for positioning the machine (e.g., different heights), provide on-stage ventilation, or generate fog for a shorter or longer period of time. In addition, many productions may have other stage-specific conditions (e.g., on-stage activities and props that enhance dispersion) that would allow actors to be present in areas that are restricted under these Guidelines but which, in fact, do not exceed the guidance levels. In those cases, production-specific monitoring would be recommended to evaluate whether peak exposure may occur.



# Calibration Factor and Time-and-Distance Guidelines

## Antari M-5 with Velocity Fluid

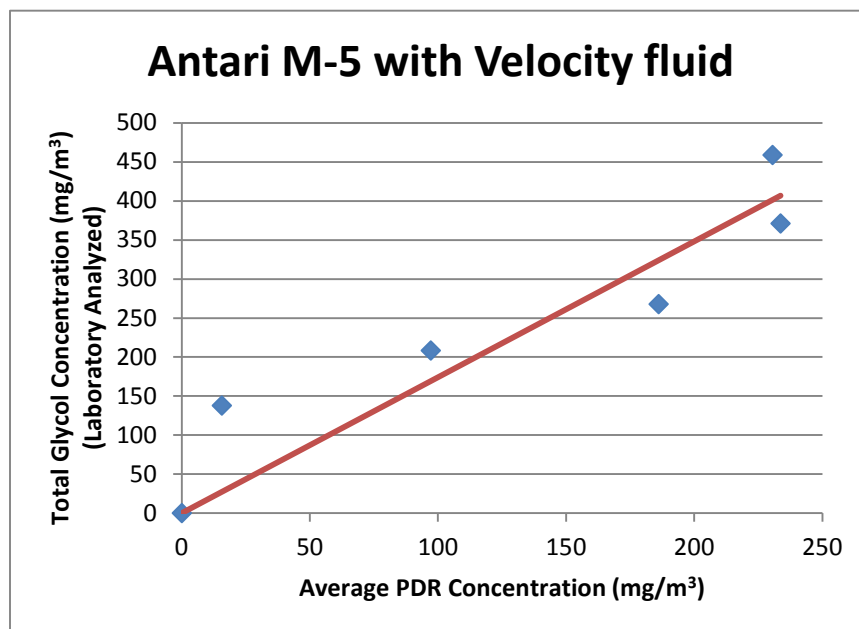
Prepared for Froggy's Fog by ENVIRON International Corporation

ENVIRON developed calibration factors and Time-and-Distance guidelines for the use of Froggy's Fog Velocity fluid in an Antari M-5 fog generator.

Velocity is a glycol-based fog fluid. Calibration factors were developed to allow a Thermo Scientific PDR-1000 aerosol monitor to be used to measure concentrations glycols in the air after being released from the M-5.

The measured concentrations should be compared against the peak exposure guidance level for glycols, which is 40 mg/m<sup>3</sup>.

The calibration curve for glycols is shown below:



**Figure 1.** Calibration curve for Antari M-5 with Velocity fluid, based on glycol laboratory data. Calibration factor, based on slope of curve, is 1.74 (mg/m<sup>3</sup> glycol) / (mg/m<sup>3</sup> aerosol).

Summary of Calibration Factor				
Manufacturer	Machine	Fluid	Fluid Type	Calibration Factor
Antari	M-5	Velocity	Glycol	1.74

**Time and Distance Guidelines.** For various distances from the cue release point, the following table provides the average time (in seconds) after the end of the cue release after which the glycol concentrations will have fallen below the guidance levels. Thus, in order to prevent peak exposures to actors, the blocking and choreography should be arranged such that actors are not situated within a particular distance from the front of the fog release point until the amount of time listed in this table has elapsed following the end of the cue. For example, if a production is using the Antari M-5/Velocity combination at 100% output with 15-second cue duration, an actor should not be situated within five to 15 feet from the front of the cue release point until at least 20 seconds following the end of the cue release.

Summary of Time-and-Distance Guidelines for Fog Generation Antari M-5 with Velocity Fluid						
Release Duration (secs)	Output Setting	Time (in sec) After Which Air Concentrations Are Below Guidance Level (40 mg/m <sup>3</sup> )				
		5 ft	10 ft	15 ft	20 ft	25 ft
5	100%	20	20	0	0	0
15	100%	20	20	20	10	0
30*	100%	20	20	20	10	0
15	65%	10	10	0	0	0
30	65%	10	10	0	0	0
60	65%	20	20	0	0	0
60	25%	20	0	0	0	0

\*Machine shuts off after 20 seconds

It should be reiterated that the Time-and-Distance Guidelines provided above are intended to allow a production to use the tested equipment and fluid combinations without conducting monitoring. However, these Guidelines may not be appropriate for all productions. Productions may want to use different configurations for positioning the machine (e.g., different heights), provide on-stage ventilation, or generate fog for a shorter or longer period of time. In addition, many productions may have other stage-specific conditions (e.g., on-stage activities and props that enhance dispersion) that would allow actors to be present in areas that are restricted under these Guidelines but which, in fact, do not exceed the guidance levels. In those cases, production-specific monitoring would be recommended to evaluate whether peak exposure may occur.



# Calibration Factor and Time-and-Distance Guidelines

## Antari M-5 with Cryo Freeze Fluid

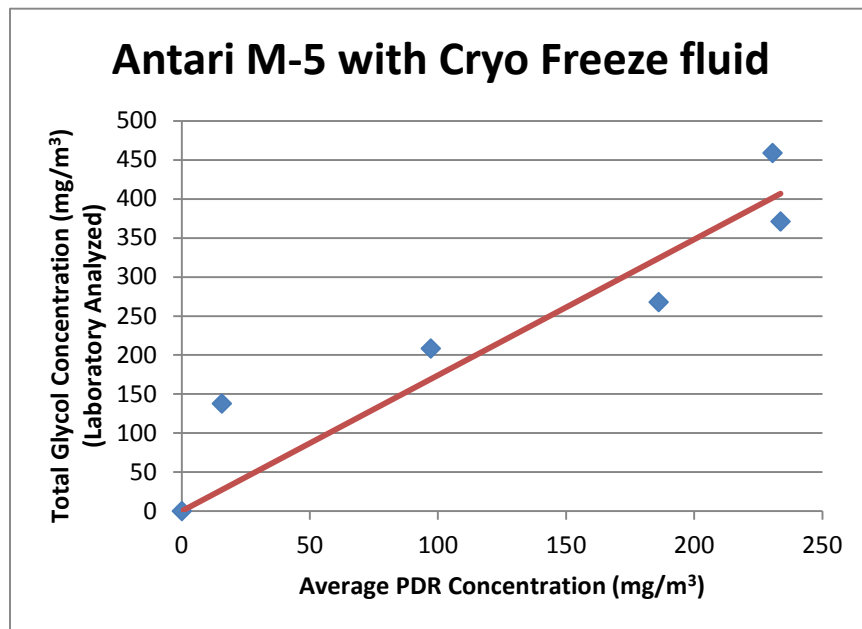
Prepared for Froggy's Fog by ENVIRON International Corporation

ENVIRON developed calibration factors and Time-and-Distance guidelines for the use of Froggy's Fog Cryo Freeze fluid in an Antari M-5 fog generator.

Cryo Freeze is a glycol-based fog fluid. Calibration factors were developed to allow a Thermo Scientific PDR-1000 aerosol monitor to be used to measure concentrations glycols in the air after being released from the M-5.

The measured concentrations should be compared against the peak exposure guidance level for glycols, which is 40 mg/m<sup>3</sup>.

The calibration curve for glycols is shown below:



**Figure 1.** Calibration curve for Antari M-5 with Cryo Freeze fluid, based on glycol laboratory data. Calibration factor, based on slope of curve, is 1.74 (mg/m<sup>3</sup> glycol) / (mg/m<sup>3</sup> aerosol).

Summary of Calibration Factor				
Manufacturer	Machine	Fluid	Fluid Type	Calibration Factor
Antari	M-5	Cryo Freeze	Glycol	1.74

**Time and Distance Guidelines.** For various distances from the cue release point, the following table provides the average time (in seconds) after the end of the cue release after which the glycol concentrations will have fallen below the guidance levels. Thus, in order to prevent peak exposures to actors, the blocking and choreography should be arranged such that actors are not situated within a particular distance from the front of the fog release point until the amount of time listed in this table has elapsed following the end of the cue. For example, if a production is using the Antari M-5/Cryo Freeze combination at 100% output with 15-second cue duration, an actor should not be situated within five to 15 feet from the front of the cue release point until at least 20 seconds following the end of the cue release.

Summary of Time-and-Distance Guidelines for Fog Generation Antari M-5 with Cryo Freeze Fluid						
Release Duration (secs)	Output Setting	Time (in sec) After Which Air Concentrations Are Below Guidance Level (40 mg/m <sup>3</sup> )				
		5 ft	10 ft	15 ft	20 ft	25 ft
5	100%	20	20	0	0	0
15	100%	20	20	20	10	0
30*	100%	20	20	20	10	0
15	65%	10	10	0	0	0
30	65%	10	10	0	0	0
60	65%	20	20	0	0	0
60	25%	20	0	0	0	0

\*Machine shuts off after 20 seconds

It should be reiterated that the Time-and-Distance Guidelines provided above are intended to allow a production to use the tested equipment and fluid combinations without conducting monitoring. However, these Guidelines may not be appropriate for all productions. Productions may want to use different configurations for positioning the machine (e.g., different heights), provide on-stage ventilation, or generate fog for a shorter or longer period of time. In addition, many productions may have other stage-specific conditions (e.g., on-stage activities and props that enhance dispersion) that would allow actors to be present in areas that are restricted under these Guidelines but which, in fact, do not exceed the guidance levels. In those cases, production-specific monitoring would be recommended to evaluate whether peak exposure may occur.





## Calibration Factor and Time-and-Distance Guidelines

### Antari M-5 with Quick Blast Fluid

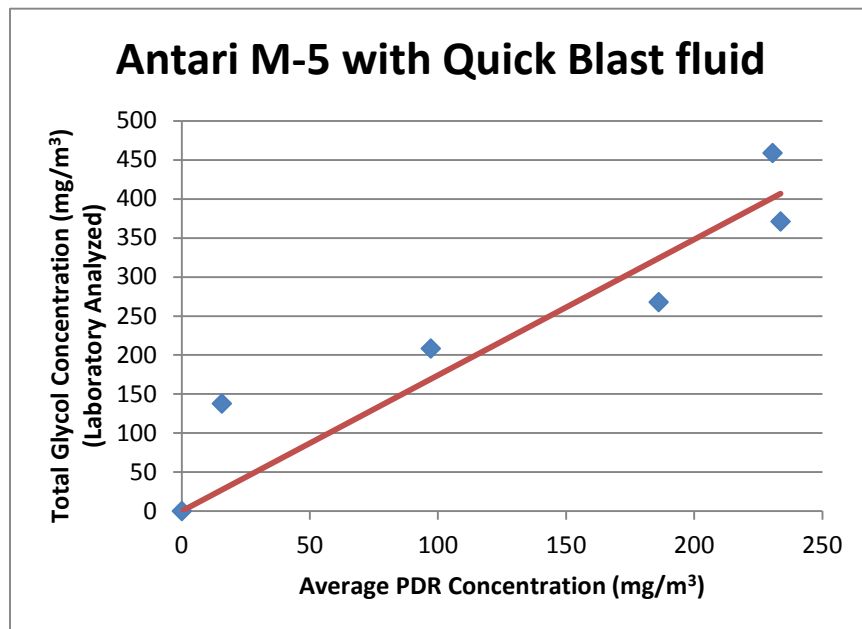
Prepared for Froggy's Fog by ENVIRON International Corporation

ENVIRON developed calibration factors and Time-and-Distance guidelines for the use of Froggy's Fog Quick Blast fluid in an Antari M-5 fog generator.

Quick Blast is a glycol-based fog fluid. Calibration factors were developed to allow a Thermo Scientific PDR-1000 aerosol monitor to be used to measure concentrations glycols in the air after being released from the M-5.

The measured concentrations should be compared against the peak exposure guidance level for glycols, which is 40 mg/m<sup>3</sup>.

The calibration curve for glycols is shown below:



**Figure 1.** Calibration curve for Antari M-5 with Quick Blast fluid, based on glycol laboratory data. Calibration factor, based on slope of curve, is 1.74 (mg/m<sup>3</sup> glycol) / (mg/m<sup>3</sup> aerosol).

Summary of Calibration Factor				
Manufacturer	Machine	Fluid	Fluid Type	Calibration Factor
Antari	M-5	Quick Blast	Glycol	1.74

**Time and Distance Guidelines.** For various distances from the cue release point, the following table provides the average time (in seconds) after the end of the cue release after which the glycol concentrations will have fallen below the guidance levels. Thus, in order to prevent peak exposures to actors, the blocking and choreography should be arranged such that actors are not situated within a particular distance from the front of the fog release point until the amount of time listed in this table has elapsed following the end of the cue. For example, if a production is using the Antari M-5/Quick Blast combination at 100% output with 15-second cue duration, an actor should not be situated within five to 15 feet from the front of the cue release point until at least 20 seconds following the end of the cue release.

Summary of Time-and-Distance Guidelines for Fog Generation Antari M-5 with Quick Blast Fluid						
Release Duration (secs)	Output Setting	Time (in sec) After Which Air Concentrations Are Below Guidance Level (40 mg/m <sup>3</sup> )				
		5 ft	10 ft	15 ft	20 ft	25 ft
5	100%	20	20	0	0	0
15	100%	20	20	20	10	0
30*	100%	20	20	20	10	0
15	65%	10	10	0	0	0
30	65%	10	10	0	0	0
60	65%	20	20	0	0	0
60	25%	20	0	0	0	0

\*Machine shuts off after 20 seconds

It should be reiterated that the Time-and-Distance Guidelines provided above are intended to allow a production to use the tested equipment and fluid combinations without conducting monitoring. However, these Guidelines may not be appropriate for all productions. Productions may want to use different configurations for positioning the machine (e.g., different heights), provide on-stage ventilation, or generate fog for a shorter or longer period of time. In addition, many productions may have other stage-specific conditions (e.g., on-stage activities and props that enhance dispersion) that would allow actors to be present in areas that are restricted under these Guidelines but which, in fact, do not exceed the guidance levels. In those cases, production-specific monitoring would be recommended to evaluate whether peak exposure may occur.



# Calibration Factor and Time-and-Distance Guidelines

## Antari M-8 with Backwood Bay Fluid

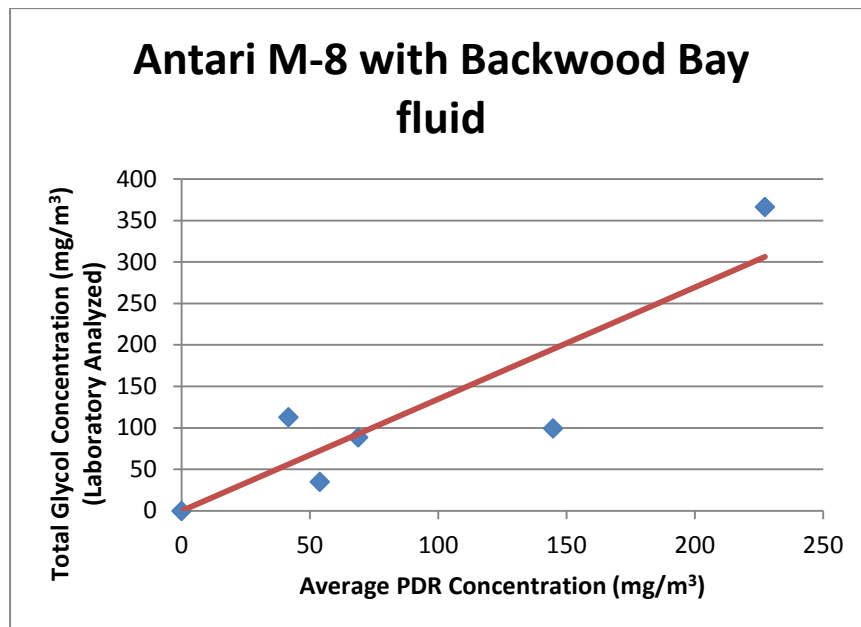
Prepared for Froggy's Fog by ENVIRON International Corporation

ENVIRON developed calibration factors and Time-and-Distance guidelines for the use of Froggy's Fog Backwood Bay fluid in an Antari M-8 fog generator.

Backwood Bay is a glycol-based fog fluid. Calibration factors were developed to allow a Thermo Scientific PDR-1000 aerosol monitor to be used to measure concentrations glycols in the air after being released from the M-8.

The measured concentrations should be compared against the peak exposure guidance level for glycols, which is 40 mg/m<sup>3</sup>.

The calibration curve for glycols is shown below:



**Figure 1.** Calibration curve for Antari M-8 with Backwood Bay fluid, based on glycol laboratory data. Calibration factor, based on slope of curve, is 1.35 (mg/m<sup>3</sup> glycol) / (mg/m<sup>3</sup> aerosol).

Summary of Calibration Factor				
Manufacturer	Machine	Fluid	Fluid Type	Calibration Factor
Antari	M-8	Backwood Bay	Glycol	1.35

**Time and Distance Guidelines.** For various distances from the cue release point, the following table provides the average time (in seconds) after the end of the cue release after which the glycol concentrations will have fallen below the guidance levels. Thus, in order to prevent peak exposures to actors, the blocking and choreography should be arranged such that actors are not situated within a particular distance from the front of the fog release point until the amount of time listed in this table has elapsed following the end of the cue. For example, if a production is using the Antari M-8/Backwood Bay combination at high output with 15-second cue duration, an actor should not be situated within five to 20 feet from the front of the cue release point until at least 80 seconds following the end of the cue release.

Summary of Time-and-Distance Guidelines for Fog Generation Antari M-8 with Backwood Bay Fluid						
Release Duration (secs)	Time (in sec) After Which Air Concentrations Are Below Guidance Level (40 mg/m <sup>3</sup> )					
	Machine Setting	5 ft	10 ft	15 ft	20 ft	25 ft
5	High	80	80	80	80	70
15	High	80	80	80	80	70
30	High	80	80	80	80	70
30	Medium	50	50	50	50	40
60	Medium	60	60	60	60	50
120*	Medium	70	70	60	60	50
60	Low <sup>†</sup>	60	60	60	60	50
120	Low <sup>†</sup>	70	70	60	60	50

\*Machine shuts off after 52 seconds

<sup>†</sup>Machine pulses every 5 seconds at low setting

It should be reiterated that the Time-and-Distance Guidelines provided above are intended to allow a production to use the tested equipment and fluid combinations without conducting monitoring. However, these Guidelines may not be appropriate for all productions. Productions may want to use different configurations for positioning the machine (e.g., different heights), provide on-stage ventilation, or generate fog for a shorter or longer period of time. In addition, many productions may have other stage-specific conditions (e.g., on-stage activities and props that enhance dispersion) that would allow actors to be present in areas that are restricted under these Guidelines but which, in fact, do not exceed the guidance levels. In those cases, production-specific monitoring would be recommended to evaluate whether peak exposure may occur.



# Calibration Factor and Time-and-Distance Guidelines

## Antari M-8 with Amusement Park Fluid

Prepared for Froggy's Fog by ENVIRON International Corporation

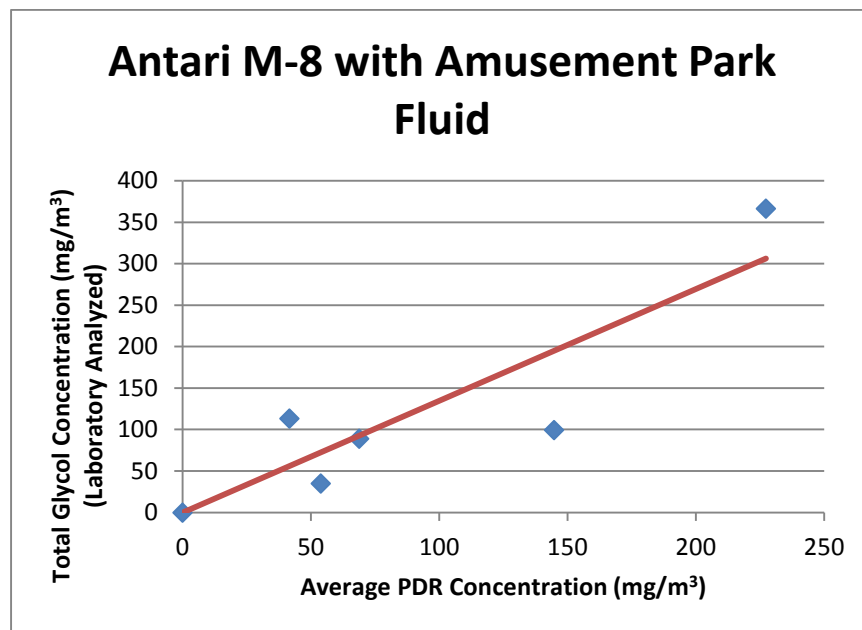
ENVIRON developed calibration factors and Time-and-Distance guidelines for the use of Froggy's Fog Amusement Park Fluid in an Antari M-8 fog generator.

Amusement Park Fluid is a glycol-based fog fluid. Calibration factors were developed to allow a Thermo Scientific PDR-1000 aerosol monitor to be used to measure concentrations glycols in the air after being released from the M-8.

The measured concentrations should be compared against the peak exposure guidance level for glycols, which is 40 mg/m<sup>3</sup>.



The calibration curve for glycols is shown below:



**Figure 1.** Calibration curve for Antari M-8 with Amusement Park Fluid, based on glycol laboratory data. Calibration factor, based on slope of curve, is 1.35 (mg/m<sup>3</sup> glycol) / (mg/m<sup>3</sup> aerosol).

Summary of Calibration Factor				
Manufacturer	Machine	Fluid	Fluid Type	Calibration Factor
Antari	M-8	Amusement Park Fluid	Glycol	1.35

**Time and Distance Guidelines.** For various distances from the cue release point, the following table provides the average time (in seconds) after the end of the cue release after which the glycol concentrations will have fallen below the guidance levels. Thus, in order to prevent peak exposures to actors, the blocking and choreography should be arranged such that actors are not situated within a particular distance from the front of the fog release point until the amount of time listed in this table has elapsed following the end of the cue. For example, if a production is using the Antari M-8/Amusement Park Fluid combination at high output with 15-second cue duration, an actor should not be situated within five to 20 feet from the front of the cue release point until at least 80 seconds following the end of the cue release.

Summary of Time-and-Distance Guidelines for Fog Generation Antari M-8 with Amusement Park Fluid						
Release Duration (secs)	Time (in sec) After Which Air Concentrations Are Below Guidance Level (40 mg/m <sup>3</sup> )					
	Machine Setting	5 ft	10 ft	15 ft	20 ft	25 ft
5	High	80	80	80	80	70
15	High	80	80	80	80	70
30	High	80	80	80	80	70
30	Medium	50	50	50	50	40
60	Medium	60	60	60	60	50
120*	Medium	70	70	60	60	50
60	Low†	60	60	60	60	50
120	Low†	70	70	60	60	50

\*Machine shuts off after 52 seconds

†Machine pulses every 5 seconds at low setting

It should be reiterated that the Time-and-Distance Guidelines provided above are intended to allow a production to use the tested equipment and fluid combinations without conducting monitoring. However, these Guidelines may not be appropriate for all productions. Productions may want to use different configurations for positioning the machine (e.g., different heights), provide on-stage ventilation, or generate fog for a shorter or longer period of time. In addition, many productions may have other stage-specific conditions (e.g., on-stage activities and props that enhance dispersion) that would allow actors to be present in areas that are restricted under these Guidelines but which, in fact, do not exceed the guidance levels. In those cases, production-specific monitoring would be recommended to evaluate whether peak exposure may occur.



# Calibration Factor and Time-and-Distance Guidelines

## Antari M-8 with Bog Fog Fluid

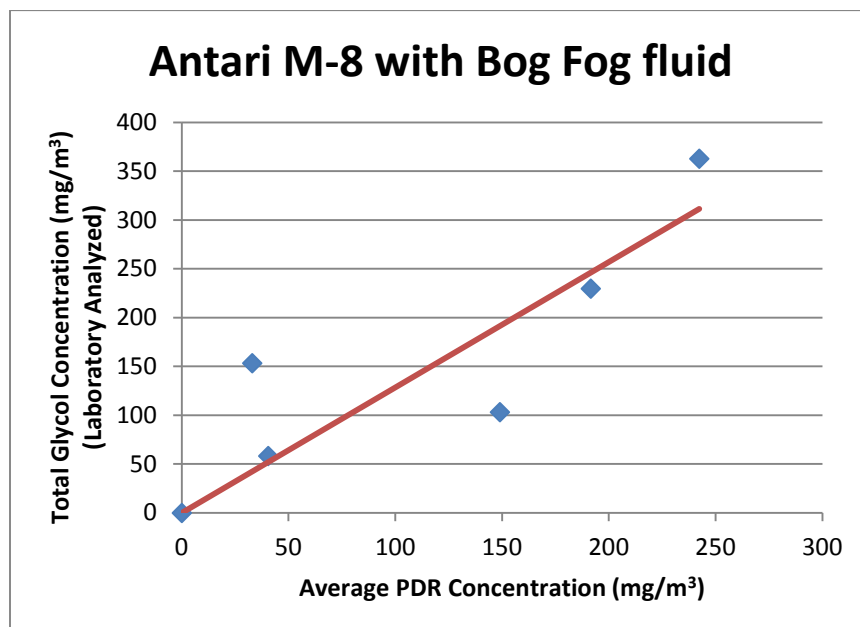
Prepared for Froggy's Fog by ENVIRON International Corporation

ENVIRON developed calibration factors and Time-and-Distance guidelines for the use of Froggy's Fog Bog Fog fluid in an Antari M-8 fog generator.

Bog Fog is a glycol-based fog fluid. Calibration factors were developed to allow a Thermo Scientific PDR-1000 aerosol monitor to be used to measure concentrations glycols in the air after being released from the M-8.

The measured concentrations should be compared against the peak exposure guidance level for glycols, which is 40 mg/m<sup>3</sup>.

The calibration curve for glycols is shown below:



**Figure 1.** Calibration curve for Antari M-8 with Bog Fog fluid, based on glycol laboratory data. Calibration factor, based on slope of curve, is 1.29 (mg/m<sup>3</sup> glycol) / (mg/m<sup>3</sup> aerosol).

Summary of Calibration Factor				
Manufacturer	Machine	Fluid	Fluid Type	Calibration Factor
Antari	M-8	Bog Fog	Glycol	1.29

**Time and Distance Guidelines.** For various distances from the cue release point, the following table provides the average time (in seconds) after the end of the cue release after which the glycol concentrations will have fallen below the guidance levels. Thus, in order to prevent peak exposures to actors, the blocking and choreography should be arranged such that actors are not situated within a particular distance from the front of the fog release point until the amount of time listed in this table has elapsed following the end of the cue. For example, if a production is using the Antari M-8/Bog Fog combination at high output with 15-second cue duration, an actor should not be situated within five to 10 feet from the front of the cue release point until at least 70 seconds following the end of the cue release.

Summary of Time-and-Distance Guidelines for Fog Generation Antari M-8 with Bog Fog Fluid						
Release Duration (secs)	Time (in sec) After Which Air Concentrations Are Below Guidance Level (40 mg/m <sup>3</sup> )					
	Machine Setting	5 ft	10 ft	15 ft	20 ft	25 ft
5	High	40	40	30	20	0
15	High	70	70	60	60	60
30	High	70	70	60	60	60
15	Med	60	60	60	60	60
30	Med	60	60	60	60	60
60*	Med	110	110	60	60	60
60	Low	110	110	10	0	0
120†	Low	110	110	10	0	0

\*Machine shuts off after 40 seconds

†Machine shuts off after 90 seconds

It should be reiterated that the Time-and-Distance Guidelines provided above are intended to allow a production to use the tested equipment and fluid combinations without conducting monitoring. However, these Guidelines may not be appropriate for all productions. Productions may want to use different configurations for positioning the machine (e.g., different heights), provide on-stage ventilation, or generate fog for a shorter or longer period of time. In addition, many productions may have other stage-specific conditions (e.g., on-stage activities and props that enhance dispersion) that would allow actors to be present in areas that are restricted under these Guidelines but which, in fact, do not exceed the guidance levels. In those cases, production-specific monitoring would be recommended to evaluate whether peak exposure may occur.





# Calibration Factor and Time-and-Distance Guidelines

## Antari M-8 with Velocity Fluid

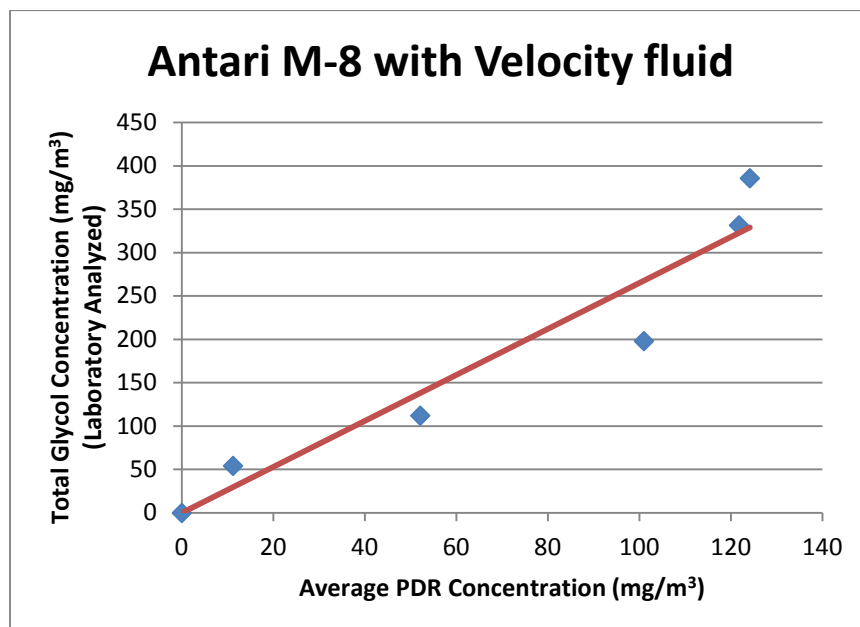
Prepared for Froggy's Fog by ENVIRON International Corporation

ENVIRON developed calibration factors and Time-and-Distance guidelines for the use of Froggy's Fog Velocity fluid in an Antari M-8 fog generator.

Velocity is a glycol-based fog fluid. Calibration factors were developed to allow a Thermo Scientific PDR-1000 aerosol monitor to be used to measure concentrations glycols in the air after being released from the M-8.

The measured concentrations should be compared against the peak exposure guidance level for glycols, which is 40 mg/m<sup>3</sup>.

The calibration curve for glycols is shown below:



**Figure 1.** Calibration curve for Antari M-8 with Velocity fluid, based on glycol laboratory data. Calibration factor, based on slope of curve, is 2.65 (mg/m<sup>3</sup> glycol) / (mg/m<sup>3</sup> aerosol).

Summary of Calibration Factor				
Manufacturer	Machine	Fluid	Fluid Type	Calibration Factor
Antari	M-8	Velocity	Glycol	2.65

**Time and Distance Guidelines.** For various distances from the cue release point, the following table provides the average time (in seconds) after the end of the cue release after which the glycol concentrations will have fallen below the guidance levels. Thus, in order to prevent peak exposures to actors, the blocking and choreography should be arranged such that actors are not situated within a particular distance from the front of the fog release point until the amount of time listed in this table has elapsed following the end of the cue. For example, if a production is using the Antari M-8/Velocity combination at high output with 15-second cue duration, an actor should not be situated within five to 10 feet from the front of the cue release point until at least 40 seconds following the end of the cue release.

Summary of Time-and-Distance Guidelines for Fog Generation Antari M-8 with Velocity Fluid						
Release Duration (secs)	Time (in sec) After Which Air Concentrations Are Below Guidance Level (40 mg/m <sup>3</sup> )					
	Machine Setting	5 ft	10 ft	15 ft	20 ft	25 ft
5	High	30	30	30	30	0
15	High	40	40	30	30	30
30*	High	40	40	30	30	30
15	Med	30	30	30	30	0
30†	Med	30	30	30	30	10
60‡	Med	30	30	30	30	10
60	Low	30	30	0	0	0
120	Low	30	30	0	0	0

\*Machine runs at reduced output volume after 10 seconds

†Machine runs at reduced output volume after 20 seconds

‡Machine shuts off after 49 seconds

It should be reiterated that the Time-and-Distance Guidelines provided above are intended to allow a production to use the tested equipment and fluid combinations without conducting monitoring. However, these Guidelines may not be appropriate for all productions. Productions may want to use different configurations for positioning the machine (e.g., different heights), provide on-stage ventilation, or generate fog for a shorter or longer period of time. In addition, many productions may have other stage-specific conditions (e.g., on-stage activities and props that enhance dispersion) that would allow actors to be present in areas that are restricted under these Guidelines but which, in fact, do not exceed the guidance levels. In those cases, production-specific monitoring would be recommended to evaluate whether peak exposure may occur.



# Calibration Factor and Time-and-Distance Guidelines

## Antari M-8 with Cryo Freeze Fluid

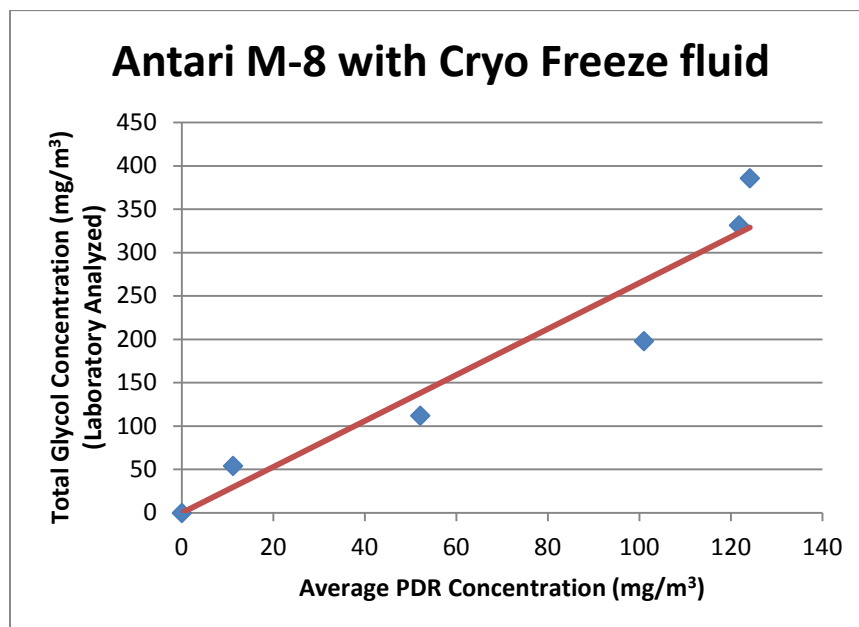
Prepared for Froggy's Fog by ENVIRON International Corporation

ENVIRON developed calibration factors and Time-and-Distance guidelines for the use of Froggy's Fog Cryo Freeze fluid in an Antari M-8 fog generator.

Cryo Freeze is a glycol-based fog fluid. Calibration factors were developed to allow a Thermo Scientific PDR-1000 aerosol monitor to be used to measure concentrations glycols in the air after being released from the M-8.

The measured concentrations should be compared against the peak exposure guidance level for glycols, which is 40 mg/m<sup>3</sup>.

The calibration curve for glycols is shown below:



**Figure 1.** Calibration curve for Antari M-8 with Cryo Freeze fluid, based on glycol laboratory data. Calibration factor, based on slope of curve, is 2.65 (mg/m<sup>3</sup> glycol) / (mg/m<sup>3</sup> aerosol).

Summary of Calibration Factor				
Manufacturer	Machine	Fluid	Fluid Type	Calibration Factor
Antari	M-8	Cryo Freeze	Glycol	2.65

**Time and Distance Guidelines.** For various distances from the cue release point, the following table provides the average time (in seconds) after the end of the cue release after which the glycol concentrations will have fallen below the guidance levels. Thus, in order to prevent peak exposures to actors, the blocking and choreography should be arranged such that actors are not situated within a particular distance from the front of the fog release point until the amount of time listed in this table has elapsed following the end of the cue. For example, if a production is using the Antari M-8/Cryo Freeze combination at high output with 15-second cue duration, an actor should not be situated within five to 10 feet from the front of the cue release point until at least 40 seconds following the end of the cue release.

Summary of Time-and-Distance Guidelines for Fog Generation Antari M-8 with Cryo Freeze Fluid						
Release Duration (secs)	Time (in sec) After Which Air Concentrations Are Below Guidance Level (40 mg/m <sup>3</sup> )					
	Machine Setting	5 ft	10 ft	15 ft	20 ft	25 ft
5	High	30	30	30	30	0
15	High	40	40	30	30	30
30*	High	40	40	30	30	30
15	Med	30	30	30	30	0
30†	Med	30	30	30	30	10
60‡	Med	30	30	30	30	10
60	Low	30	30	0	0	0
120	Low	30	30	0	0	0

\*Machine runs at reduced output volume after 10 seconds

†Machine runs at reduced output volume after 20 seconds

‡Machine shuts off after 49 seconds

It should be reiterated that the Time-and-Distance Guidelines provided above are intended to allow a production to use the tested equipment and fluid combinations without conducting monitoring. However, these Guidelines may not be appropriate for all productions. Productions may want to use different configurations for positioning the machine (e.g., different heights), provide on-stage ventilation, or generate fog for a shorter or longer period of time. In addition, many productions may have other stage-specific conditions (e.g., on-stage activities and props that enhance dispersion) that would allow actors to be present in areas that are restricted under these Guidelines but which, in fact, do not exceed the guidance levels. In those cases, production-specific monitoring would be recommended to evaluate whether peak exposure may occur.



# Calibration Factor and Time-and-Distance Guidelines

## Antari M-8 with Quick Blast Fluid

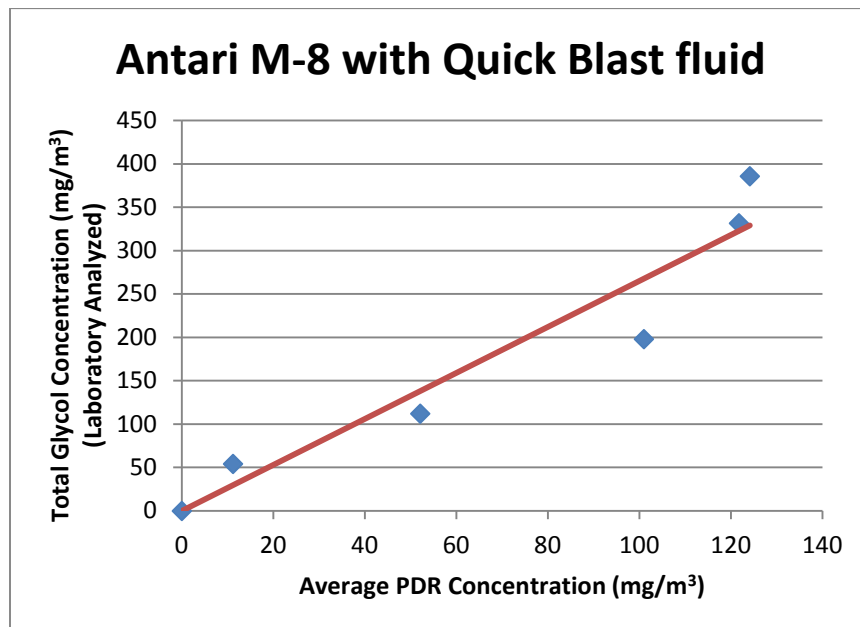
Prepared for Froggy's Fog by ENVIRON International Corporation

ENVIRON developed calibration factors and Time-and-Distance guidelines for the use of Froggy's Fog Quick Blast fluid in an Antari M-8 fog generator.

Quick Blast is a glycol-based fog fluid. Calibration factors were developed to allow a Thermo Scientific PDR-1000 aerosol monitor to be used to measure concentrations glycols in the air after being released from the M-8.

The measured concentrations should be compared against the peak exposure guidance level for glycols, which is 40 mg/m<sup>3</sup>.

The calibration curve for glycols is shown below:



**Figure 1.** Calibration curve for Antari M-8 with Quick Blast fluid, based on glycol laboratory data. Calibration factor, based on slope of curve, is 2.65 (mg/m<sup>3</sup> glycol) / (mg/m<sup>3</sup> aerosol).

Summary of Calibration Factor				
Manufacturer	Machine	Fluid	Fluid Type	Calibration Factor
Antari	M-8	Quick Blast	Glycol	2.65

**Time and Distance Guidelines.** For various distances from the cue release point, the following table provides the average time (in seconds) after the end of the cue release after which the glycol concentrations will have fallen below the guidance levels. Thus, in order to prevent peak exposures to actors, the blocking and choreography should be arranged such that actors are not situated within a particular distance from the front of the fog release point until the amount of time listed in this table has elapsed following the end of the cue. For example, if a production is using the Antari M-8/Quick Blast combination at high output with 15-second cue duration, an actor should not be situated within five to 10 feet from the front of the cue release point until at least 40 seconds following the end of the cue release.

Summary of Time-and-Distance Guidelines for Fog Generation						
Antari M-8 with Quick Blast Fluid						
Release Duration (secs)	Time (in sec) After Which Air Concentrations Are Below Guidance Level (40 mg/m <sup>3</sup> )					
	Machine Setting	5 ft	10 ft	15 ft	20 ft	25 ft
5	High	30	30	30	30	0
15	High	40	40	30	30	30
30*	High	40	40	30	30	30
15	Med	30	30	30	30	0
30†	Med	30	30	30	30	10
60‡	Med	30	30	30	30	10
60	Low	30	30	0	0	0
120	Low	30	30	0	0	0

\*Machine runs at reduced output volume after 10 seconds

†Machine runs at reduced output volume after 20 seconds

‡Machine shuts off after 49 seconds

It should be reiterated that the Time-and-Distance Guidelines provided above are intended to allow a production to use the tested equipment and fluid combinations without conducting monitoring. However, these Guidelines may not be appropriate for all productions. Productions may want to use different configurations for positioning the machine (e.g., different heights), provide on-stage ventilation, or generate fog for a shorter or longer period of time. In addition, many productions may have other stage-specific conditions (e.g., on-stage activities and props that enhance dispersion) that would allow actors to be present in areas that are restricted under these Guidelines but which, in fact, do not exceed the guidance levels. In those cases, production-specific monitoring would be recommended to evaluate whether peak exposure may occur.



# Calibration Factor and Time-and-Distance Guidelines

## Antari M-10 with Bog Fog Fluid

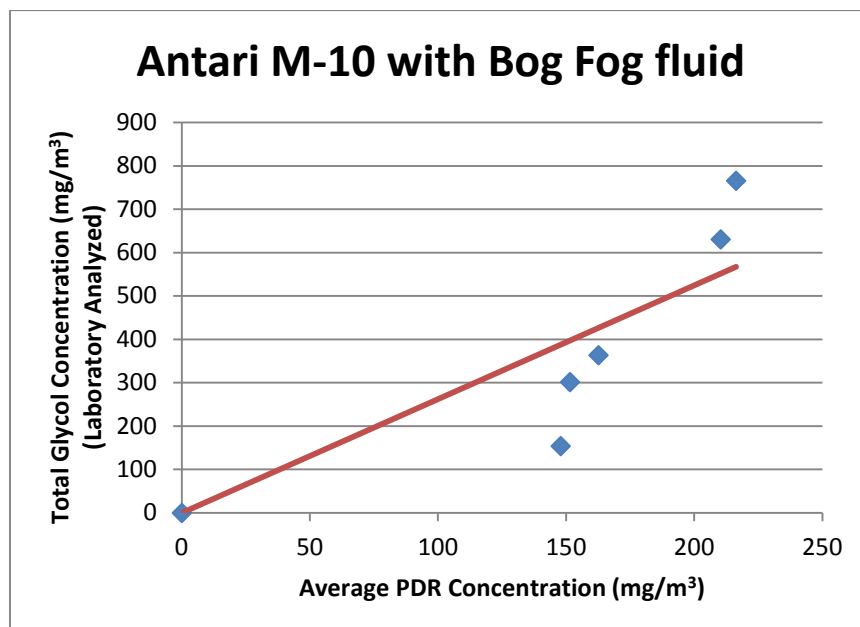
Prepared for Froggy's Fog by ENVIRON International Corporation

ENVIRON developed calibration factors and Time-and-Distance guidelines for the use of Froggy's Fog Bog Fog fluid in an Antari M-10 fog generator.

Bog Fog is a glycol-based fog fluid. Calibration factors were developed to allow a Thermo Scientific PDR-1000 aerosol monitor to be used to measure concentrations glycols in the air after being released from the M-10.

The measured concentrations should be compared against the peak exposure guidance level for glycols, which is 40 mg/m<sup>3</sup>.

The calibration curve for glycols is shown below:



**Figure 1.** Calibration curve for Antari M-10 with Bog Fog fluid, based on glycol laboratory data. Calibration factor, based on slope of curve, is 2.62 (mg/m<sup>3</sup> glycol) / (mg/m<sup>3</sup> aerosol).

Summary of Calibration Factor				
Manufacturer	Machine	Fluid	Fluid Type	Calibration Factor
Antari	M-10	Bog Fog	Glycol	2.62

**Time and Distance Guidelines.** For various distances from the cue release point, the following table provides the average time (in seconds) after the end of the cue release after which the glycol concentrations will have fallen below the guidance levels. Thus, in order to prevent peak exposures to actors, the blocking and choreography should be arranged such that actors are not situated within a particular distance from the front of the fog release point until the amount of time listed in this table has elapsed following the end of the cue. For example, if a production is using the Antari M-10/Bog Fog combination at 100% output with 15-second cue duration, an actor should not be situated within five to 10 feet from the front of the cue release point until at least 100 seconds following the end of the cue release.

Summary of Time-and-Distance Guidelines for Fog Generation Antari M-10 with Bog Fog Fluid						
Release Duration (secs)	Time (in sec) After Which Air Concentrations Are Below Guidance Level (40 mg/m <sup>3</sup> )					
	Machine Setting	5 ft	10 ft	15 ft	20 ft	25 ft
5	100%	90	90	90	70	70
15	100%	100	100	90	70	70
30	100%	120	120	100	100	70
15	65%	90	60	50	40	30
30	65%	120	120	70	70	60
60*	65%	120	120	70	70	60
60	25%	60	0	0	0	0
120	25%	60	30	0	0	0

\*Machine shuts off after 48 seconds

It should be reiterated that the Time-and-Distance Guidelines provided above are intended to allow a production to use the tested equipment and fluid combinations without conducting monitoring. However, these Guidelines may not be appropriate for all productions. Productions may want to use different configurations for positioning the machine (e.g., different heights), provide on-stage ventilation, or generate fog for a shorter or longer period of time. In addition, many productions may have other stage-specific conditions (e.g., on-stage activities and props that enhance dispersion) that would allow actors to be present in areas that are restricted under these Guidelines but which, in fact, do not exceed the guidance levels. In those cases, production-specific monitoring would be recommended to evaluate whether peak exposure may occur.





# Calibration Factor and Time-and-Distance Guidelines

## Antari M-10 with Velocity Fluid

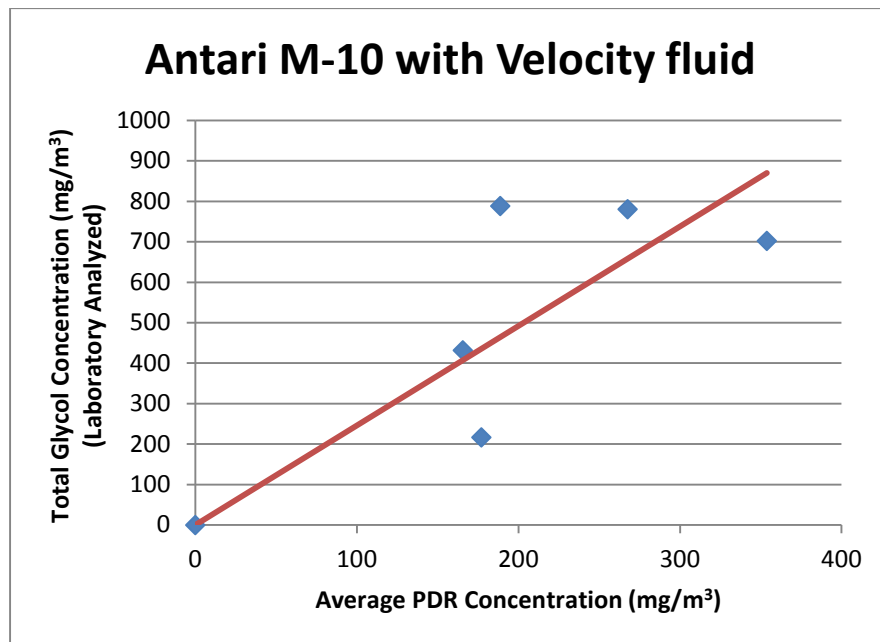
Prepared for Froggy's Fog by ENVIRON International Corporation

ENVIRON developed calibration factors and Time-and-Distance guidelines for the use of Froggy's Fog Velocity fluid in an Antari M-10 fog generator.

Velocity is a glycol-based fog fluid. Calibration factors were developed to allow a Thermo Scientific PDR-1000 aerosol monitor to be used to measure concentrations glycols in the air after being released from the M-10.

The measured concentrations should be compared against the peak exposure guidance level for glycols, which is 40 mg/m<sup>3</sup>.

The calibration curve for glycols is shown below:



**Figure 1.** Calibration curve for Antari M-10 with Velocity fluid, based on glycol laboratory data. Calibration factor, based on slope of curve, is 2.46 (mg/m<sup>3</sup> glycol) / (mg/m<sup>3</sup> aerosol).

Summary of Calibration Factor				
Manufacturer	Machine	Fluid	Fluid Type	Calibration Factor
Antari	M-10	Velocity	Glycol	2.46

**Time and Distance Guidelines.** For various distances from the cue release point, the following table provides the average time (in seconds) after the end of the cue release after which the glycol concentrations will have fallen below the guidance levels. Thus, in order to prevent peak exposures to actors, the blocking and choreography should be arranged such that actors are not situated within a particular distance from the front of the fog release point until the amount of time listed in this table has elapsed following the end of the cue. For example, if a production is using the Antari M-10/Velocity combination at 100% output with 15-second cue duration, an actor should not be situated within five to 20 feet from the front of the cue release point until at least 30 seconds following the end of the cue release.

Summary of Time-and-Distance Guidelines for Fog Generation Antari M-10 with Velocity Fluid						
Release Duration (secs)	Time (in sec) After Which Air Concentrations Are Below Guidance Level (40 mg/m <sup>3</sup> )					
	Machine Setting	5 ft	10 ft	15 ft	20 ft	25 ft
5	100%	30	30	30	30	20
15	100%	30	30	30	30	20
30	100%	30	30	30	30	20
15	65%	30	20	20	0	0
30	65%	30	30	30	0	0
60	65%	30	30	30	0	0
60	25%	0	0	0	0	0
120	25%	0	0	0	0	0

It should be reiterated that the Time-and-Distance Guidelines provided above are intended to allow a production to use the tested equipment and fluid combinations without conducting monitoring. However, these Guidelines may not be appropriate for all productions. Productions may want to use different configurations for positioning the machine (e.g., different heights), provide on-stage ventilation, or generate fog for a shorter or longer period of time. In addition, many productions may have other stage-specific conditions (e.g., on-stage activities and props that enhance dispersion) that would allow actors to be present in areas that are restricted under these Guidelines but which, in fact, do not exceed the guidance levels. In those cases, production-specific monitoring would be recommended to evaluate whether peak exposure may occur.



# Calibration Factor and Time-and-Distance Guidelines

## Antari M-10 with Cryo Freeze Fluid

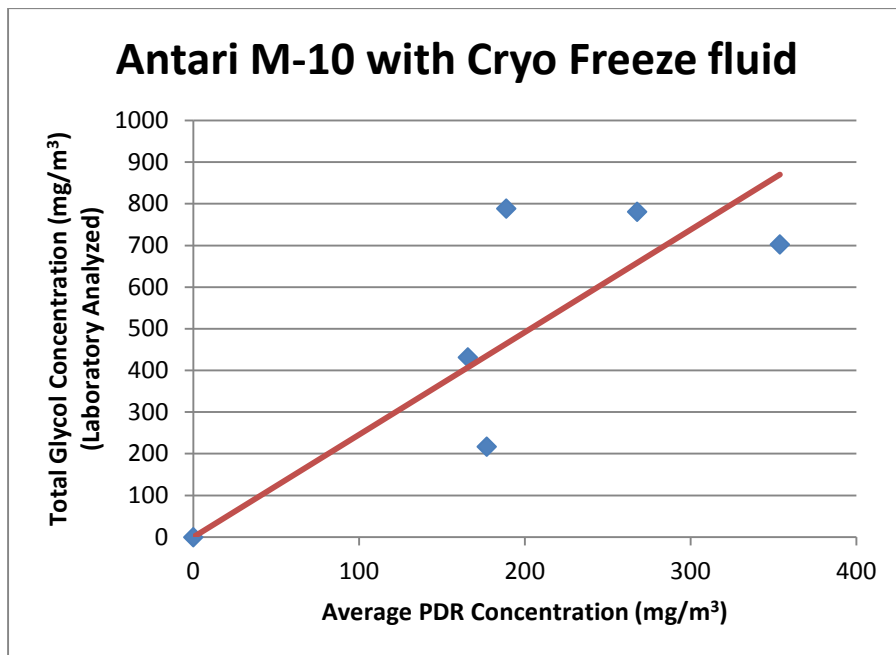
Prepared for Froggy's Fog by ENVIRON International Corporation

ENVIRON developed calibration factors and Time-and-Distance guidelines for the use of Froggy's Fog Cryo Freeze fluid in an Antari M-10 fog generator.

Cryo Freeze is a glycol-based fog fluid. Calibration factors were developed to allow a Thermo Scientific PDR-1000 aerosol monitor to be used to measure concentrations glycols in the air after being released from the M-10.

The measured concentrations should be compared against the peak exposure guidance level for glycols, which is 40 mg/m<sup>3</sup>.

The calibration curve for glycols is shown below:



**Figure 1.** Calibration curve for Antari M-10 with Cryo Freeze fluid, based on glycol laboratory data. Calibration factor, based on slope of curve, is 2.46 (mg/m<sup>3</sup> glycol) / (mg/m<sup>3</sup> aerosol).

Summary of Calibration Factor				
Manufacturer	Machine	Fluid	Fluid Type	Calibration Factor
Antari	M-10	Cryo Freeze	Glycol	2.46

**Time and Distance Guidelines.** For various distances from the cue release point, the following table provides the average time (in seconds) after the end of the cue release after which the glycol concentrations will have fallen below the guidance levels. Thus, in order to prevent peak exposures to actors, the blocking and choreography should be arranged such that actors are not situated within a particular distance from the front of the fog release point until the amount of time listed in this table has elapsed following the end of the cue. For example, if a production is using the Antari M-10/Cryo Freeze combination at 100% output with 15-second cue duration, an actor should not be situated within five to 20 feet from the front of the cue release point until at least 30 seconds following the end of the cue release.

Summary of Time-and-Distance Guidelines for Fog Generation Antari M-10 with Cryo Freeze Fluid						
Release Duration (secs)	Time (in sec) After Which Air Concentrations Are Below Guidance Level (40 mg/m <sup>3</sup> )					
	Machine Setting	5 ft	10 ft	15 ft	20 ft	25 ft
5	100%	30	30	30	30	20
15	100%	30	30	30	30	20
30	100%	30	30	30	30	20
15	65%	30	20	20	0	0
30	65%	30	30	30	0	0
60	65%	30	30	30	0	0
60	25%	0	0	0	0	0
120	25%	0	0	0	0	0

It should be reiterated that the Time-and-Distance Guidelines provided above are intended to allow a production to use the tested equipment and fluid combinations without conducting monitoring. However, these Guidelines may not be appropriate for all productions. Productions may want to use different configurations for positioning the machine (e.g., different heights), provide on-stage ventilation, or generate fog for a shorter or longer period of time. In addition, many productions may have other stage-specific conditions (e.g., on-stage activities and props that enhance dispersion) that would allow actors to be present in areas that are restricted under these Guidelines but which, in fact, do not exceed the guidance levels. In those cases, production-specific monitoring would be recommended to evaluate whether peak exposure may occur.



# Calibration Factor and Time-and-Distance Guidelines

## Antari M-10 with Quick Blast Fluid

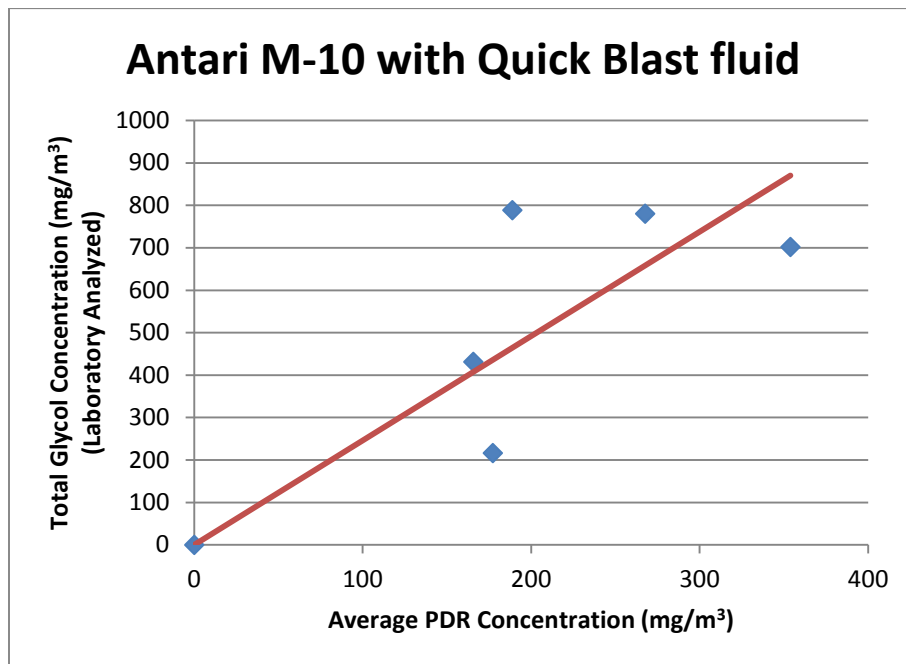
Prepared for Froggy's Fog by ENVIRON International Corporation

ENVIRON developed calibration factors and Time-and-Distance guidelines for the use of Froggy's Fog Quick Blast fluid in an Antari M-10 fog generator.

Quick Blast is a glycol-based fog fluid. Calibration factors were developed to allow a Thermo Scientific PDR-1000 aerosol monitor to be used to measure concentrations glycols in the air after being released from the M-10.

The measured concentrations should be compared against the peak exposure guidance level for glycols, which is 40 mg/m<sup>3</sup>.

The calibration curve for glycols is shown below:



**Figure 1.** Calibration curve for Antari M-10 with Quick Blast fluid, based on glycol laboratory data. Calibration factor, based on slope of curve, is 2.46 (mg/m<sup>3</sup> glycol) / (mg/m<sup>3</sup> aerosol).

Summary of Calibration Factor				
Manufacturer	Machine	Fluid	Fluid Type	Calibration Factor
Antari	M-10	Quick Blast	Glycol	2.46

**Time and Distance Guidelines.** For various distances from the cue release point, the following table provides the average time (in seconds) after the end of the cue release after which the glycol concentrations will have fallen below the guidance levels. Thus, in order to prevent peak exposures to actors, the blocking and choreography should be arranged such that actors are not situated within a particular distance from the front of the fog release point until the amount of time listed in this table has elapsed following the end of the cue. For example, if a production is using the Antari M-10/Quick Blast combination at 100% output with 15-second cue duration, an actor should not be situated within five to 20 feet from the front of the cue release point until at least 30 seconds following the end of the cue release.

Summary of Time-and-Distance Guidelines for Fog Generation Antari M-10 with Quick Blast Fluid						
Release Duration (secs)	Time (in sec) After Which Air Concentrations Are Below Guidance Level (40 mg/m <sup>3</sup> )					
	Machine Setting	5 ft	10 ft	15 ft	20 ft	25 ft
5	100%	30	30	30	30	20
15	100%	30	30	30	30	20
30	100%	30	30	30	30	20
15	65%	30	20	20	0	0
30	65%	30	30	30	0	0
60	65%	30	30	30	0	0
60	25%	0	0	0	0	0
120	25%	0	0	0	0	0

It should be reiterated that the Time-and-Distance Guidelines provided above are intended to allow a production to use the tested equipment and fluid combinations without conducting monitoring. However, these Guidelines may not be appropriate for all productions. Productions may want to use different configurations for positioning the machine (e.g., different heights), provide on-stage ventilation, or generate fog for a shorter or longer period of time. In addition, many productions may have other stage-specific conditions (e.g., on-stage activities and props that enhance dispersion) that would allow actors to be present in areas that are restricted under these Guidelines but which, in fact, do not exceed the guidance levels. In those cases, production-specific monitoring would be recommended to evaluate whether peak exposure may occur.



## Calibration Factor and Time-and-Distance Guidelines

### Antari X-515 with Backwood Bay Fluid

Prepared for Froggy's Fog by ENVIRON International Corporation

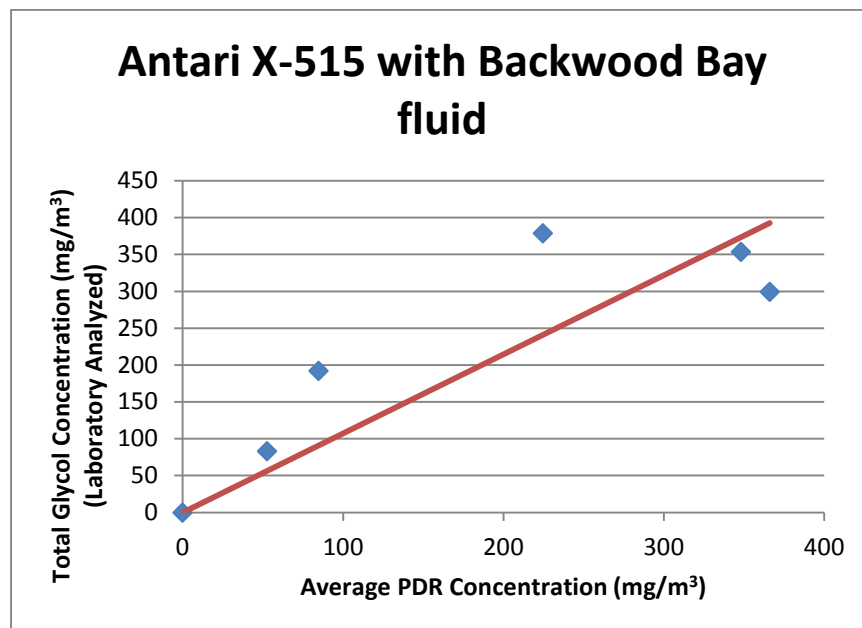
ENVIRON developed calibration factors and Time-and-Distance guidelines for the use of Froggy's Fog Backwood Bay fluid in an Antari X-515 fog generator.

Backwood Bay is a glycol-based fog fluid. Calibration factors were developed to allow a Thermo Scientific PDR-1000 aerosol monitor to be used to measure concentrations glycols in the air after being released from the X-515.

The measured concentrations should be compared against the peak exposure guidance level for glycols, which is 40 mg/m<sup>3</sup>.



The calibration curve for glycols is shown below:



**Figure 1.** Calibration curve for Antari X-515 with Backwood Bay fluid, based on glycol laboratory data. Calibration factor, based on slope of curve, is 1.07 (mg/m<sup>3</sup> glycol) / (mg/m<sup>3</sup> aerosol).

Summary of Calibration Factor				
Manufacturer	Machine	Fluid	Fluid Type	Calibration Factor
Antari	X-515	Backwood Bay	Glycol	1.07

**Time and Distance Guidelines.** For various distances from the cue release point, the following table provides the average time (in seconds) after the end of the cue release after which the glycol concentrations will have fallen below the guidance levels. Thus, in order to prevent peak exposures to actors, the blocking and choreography should be arranged such that actors are not situated within a particular distance from the front of the fog release point until the amount of time listed in this table has elapsed following the end of the cue. For example, if a production is using the Antari X-515/Backwood Bay combination at 100% output with 30-second cue duration, an actor should not be situated within five to 15 feet from the front of the cue release point until at least 70 seconds following the end of the cue release.

Summary of Time-and-Distance Guidelines for Fog Generation Antari X-515 with Backwood Bay Fluid						
Release Duration (secs)	Time (in sec) After Which Air Concentrations Are Below Guidance Level (40 mg/m <sup>3</sup> )					
	Machine Setting	5 ft	10 ft	15 ft	20 ft	25 ft
5	100%	40	40	40	40	0
15	100%	70	70	70	50	40
30	100%	70	70	70	50	40
30	65%	50	40	40	40	0
60	65%	70	70	40	40	0
120*	65%	70	70	40	40	0
60	25%	60	50	30	0	0
120	25%	60	50	30	0	0

\*Machine ran at reduced output volume after 45 seconds, machine turned off for 37 seconds during run

It should be reiterated that the Time-and-Distance Guidelines provided above are intended to allow a production to use the tested equipment and fluid combinations without conducting monitoring. However, these Guidelines may not be appropriate for all productions. Productions may want to use different configurations for positioning the machine (e.g., different heights), provide on-stage ventilation, or generate fog for a shorter or longer period of time. In addition, many productions may have other stage-specific conditions (e.g., on-stage activities and props that enhance dispersion) that would allow actors to be present in areas that are restricted under these Guidelines but which, in fact, do not exceed the guidance levels. In those cases, production-specific monitoring would be recommended to evaluate whether peak exposure may occur.





# Calibration Factor and Time-and-Distance Guidelines

## Antari X-515 with Amusement Park Fluid

Prepared for Froggy's Fog by ENVIRON International Corporation

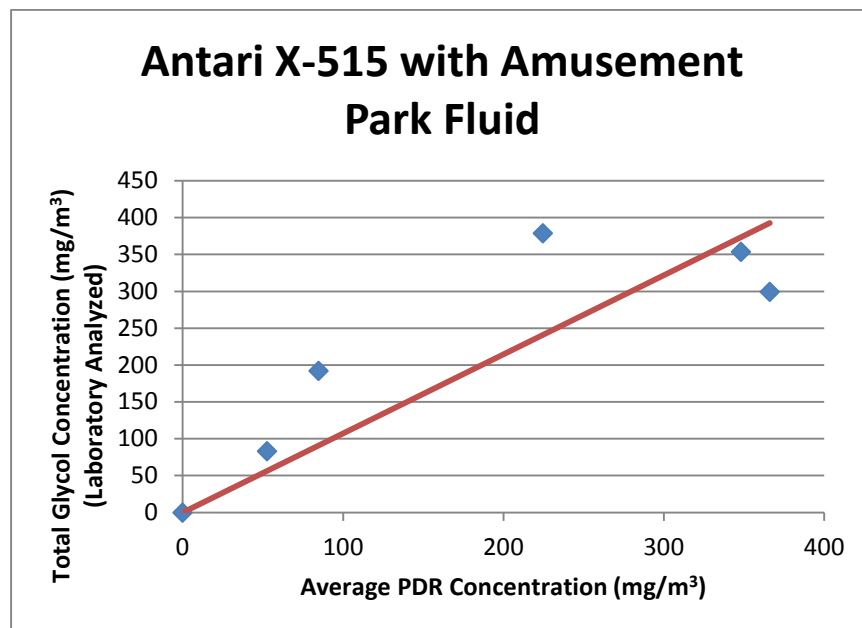
ENVIRON developed calibration factors and Time-and-Distance guidelines for the use of Froggy's Fog Amusement Park Fluid in an Antari X-515 fog generator.

Amusement Park Fluid is a glycol-based fog fluid. Calibration factors were developed to allow a Thermo Scientific PDR-1000 aerosol monitor to be used to measure concentrations glycols in the air after being released from the X-515.

The measured concentrations should be compared against the peak exposure guidance level for glycols, which is 40 mg/m<sup>3</sup>.



The calibration curve for glycols is shown below:



**Figure 1.** Calibration curve for Antari X-515 with Amusement Park Fluid, based on glycol laboratory data. Calibration factor, based on slope of curve, is 1.07 (mg/m<sup>3</sup> glycol) / (mg/m<sup>3</sup> aerosol).

Summary of Calibration Factor				
Manufacturer	Machine	Fluid	Fluid Type	Calibration Factor
Antari	X-515	Amusement Park Fluid	Glycol	1.07

**Time and Distance Guidelines.** For various distances from the cue release point, the following table provides the average time (in seconds) after the end of the cue release after which the glycol concentrations will have fallen below the guidance levels. Thus, in order to prevent peak exposures to actors, the blocking and choreography should be arranged such that actors are not situated within a particular distance from the front of the fog release point until the amount of time listed in this table has elapsed following the end of the cue. For example, if a production is using the Antari X-515/Amusement Park Fluid combination at 100% output with 30-second cue duration, an actor should not be situated within five to 15 feet from the front of the cue release point until at least 70 seconds following the end of the cue release.

Summary of Time-and-Distance Guidelines for Fog Generation Antari X-515 with Amusement Park Fluid						
Release Duration (secs)	Time (in sec) After Which Air Concentrations Are Below Guidance Level (40 mg/m <sup>3</sup> )					
	Machine Setting	5 ft	10 ft	15 ft	20 ft	25 ft
5	100%	40	40	40	40	0
15	100%	70	70	70	50	40
30	100%	70	70	70	50	40
30	65%	50	40	40	40	0
60	65%	70	70	40	40	0
120*	65%	70	70	40	40	0
60	25%	60	50	30	0	0
120	25%	60	50	30	0	0

\*Machine ran at reduced output volume after 45 seconds, machine turned off for 37 seconds during run

It should be reiterated that the Time-and-Distance Guidelines provided above are intended to allow a production to use the tested equipment and fluid combinations without conducting monitoring. However, these Guidelines may not be appropriate for all productions. Productions may want to use different configurations for positioning the machine (e.g., different heights), provide on-stage ventilation, or generate fog for a shorter or longer period of time. In addition, many productions may have other stage-specific conditions (e.g., on-stage activities and props that enhance dispersion) that would allow actors to be present in areas that are restricted under these Guidelines but which, in fact, do not exceed the guidance levels. In those cases, production-specific monitoring would be recommended to evaluate whether peak exposure may occur.



# Calibration Factor and Time-and-Distance Guidelines

## Antari X-515 with Bog Fog Fluid

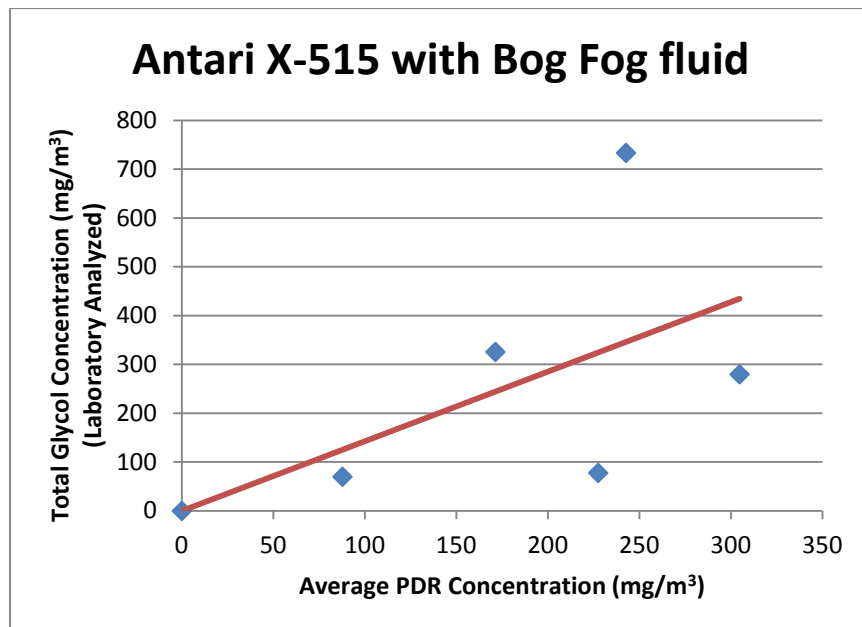
Prepared for Froggy's Fog by ENVIRON International Corporation

ENVIRON developed calibration factors and Time-and-Distance guidelines for the use of Froggy's Fog Bog Fog fluid in a Antari Fog X-515 fog generator.

Bog Fog is a glycol-based fog fluid. Calibration factors were developed to allow a Thermo Scientific PDR-1000 aerosol monitor to be used to measure concentrations glycols in the air after being released from the X-515.

The measured concentrations should be compared against the peak exposure guidance level for glycols, which is 40 mg/m<sup>3</sup>.

The calibration curve for glycols is shown below:



**Figure 1.** Calibration curve for Antari X-515 with Bog Fog fluid, based on glycol laboratory data. Calibration factor, based on slope of curve, is 1.43 (mg/m<sup>3</sup> glycol) / (mg/m<sup>3</sup> aerosol).

Summary of Calibration Factor				
Manufacturer	Machine	Fluid	Fluid Type	Calibration Factor
Antari	X-515	Bog Fog	Glycol	1.43

**Time and Distance Guidelines.** For various distances from the cue release point, the following table provides the average time (in seconds) after the end of the cue release after which the glycol concentrations will have fallen below the guidance levels. Thus, in order to prevent peak exposures to actors, the blocking and choreography should be arranged such that actors are not situated within a particular distance from the front of the fog release point until the amount of time listed in this table has elapsed following the end of the cue. For example, if a production is using the Antari Fog X-515/Bog Fog combination at 100% output with 30-second cue duration, an actor should not be situated within five to 10 feet from the front of the cue release point until at least 80 seconds following the end of the cue release.

Summary of Time-and-Distance Guidelines for Fog Generation						
Antari X-515 with Bog Fog Fluid						
Release Duration (secs)	Time (in sec) After Which Air Concentrations Are Below Guidance Level (40 mg/m <sup>3</sup> )					
	Machine Setting	5 ft	10 ft	15 ft	20 ft	25 ft
5	100%	40	30	0	0	0
15	100%	50	30	0	0	0
30	100%	80	80	70	30	0
30	65%	80	60	50	0	0
60*	65%	80	60	50	30	10
120*	65%	80	60	50	30	10
60	25%	80	40	0	0	0
120†	25%	80	40	0	0	0

\*Machine runs at reduced output volume after 25 seconds

†Machine runs at reduced output volume after 4 seconds

It should be reiterated that the Time-and-Distance Guidelines provided above are intended to allow a production to use the tested equipment and fluid combinations without conducting monitoring. However, these Guidelines may not be appropriate for all productions. Productions may want to use different configurations for positioning the machine (e.g., different heights), provide on-stage ventilation, or generate fog for a shorter or longer period of time. In addition, many productions may have other stage-specific conditions (e.g., on-stage activities and props that enhance dispersion) that would allow actors to be present in areas that are restricted under these Guidelines but which, in fact, do not exceed the guidance levels. In those cases, production-specific monitoring would be recommended to evaluate whether peak exposure may occur.



# Calibration Factor and Time-and-Distance Guidelines

## Antari X-515 with Cryo Freeze Fluid

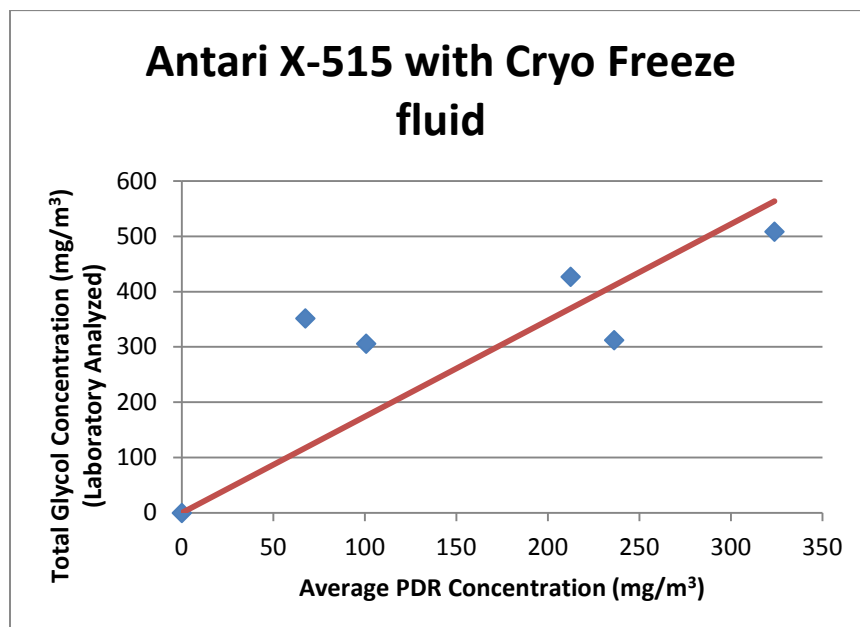
Prepared for Froggy's Fog by ENVIRON International Corporation

ENVIRON developed calibration factors and Time-and-Distance guidelines for the use of Froggy's Fog Cryo Freeze fluid in a Antari X-515 fog generator.

Cryo Freeze is a glycol-based fog fluid. Calibration factors were developed to allow a Thermo Scientific PDR-1000 aerosol monitor to be used to measure concentrations glycols in the air after being released from the X-515.

The measured concentrations should be compared against the peak exposure guidance level for glycols, which is 40 mg/m<sup>3</sup>.

The calibration curve for glycols is shown below:



**Figure 1.** Calibration curve for Antari X-515 with Cryo Freeze fluid, based on glycol laboratory data. Calibration factor, based on slope of curve, is 1.74 (mg/m<sup>3</sup> glycol) / (mg/m<sup>3</sup> aerosol).

Summary of Calibration Factor				
Manufacturer	Machine	Fluid	Fluid Type	Calibration Factor
Antari	X-515	Cryo Freeze	Glycol	1.74

**Time and Distance Guidelines.** For various distances from the cue release point, the following table provides the average time (in seconds) after the end of the cue release after which the glycol concentrations will have fallen below the guidance levels. Thus, in order to prevent peak exposures to actors, the blocking and choreography should be arranged such that actors are not situated within a particular distance from the front of the fog release point until the amount of time listed in this table has elapsed following the end of the cue. For example, if a production is using the Antari X-515/Cryo Freeze combination at 100% output with 15-second cue duration, an actor should not be situated within five feet from the front of the cue release point until at least 20 seconds following the end of the cue release.

Summary of Time-and-Distance Guidelines for Fog Generation Antari X-515 with Cryo Freeze Fluid						
Release Duration (secs)	Time (in sec) After Which Air Concentrations Are Below Guidance Level (40 mg/m <sup>3</sup> )					
	Machine Setting	5 ft	10 ft	15 ft	20 ft	25 ft
5	100%	0	0	0	0	0
15	100%	20	0	0	0	0
30*	100%	20	20	0	0	0
30	65%	20	10	0	0	0
60	65%	20	10	0	0	0
120	65%	20	10	0	0	0
60	25%	0	0	0	0	0
120	25%	0	0	0	0	0

\*Machine ran at reduced output volume after 20 seconds

It should be reiterated that the Time-and-Distance Guidelines provided above are intended to allow a production to use the tested equipment and fluid combinations without conducting monitoring. However, these Guidelines may not be appropriate for all productions. Productions may want to use different configurations for positioning the machine (e.g., different heights), provide on-stage ventilation, or generate fog for a shorter or longer period of time. In addition, many productions may have other stage-specific conditions (e.g., on-stage activities and props that enhance dispersion) that would allow actors to be present in areas that are restricted under these Guidelines but which, in fact, do not exceed the guidance levels. In those cases, production-specific monitoring would be recommended to evaluate whether peak exposure may occur.



# Calibration Factor and Time-and-Distance Guidelines

## Antari X-515 with Quick Blast Fluid

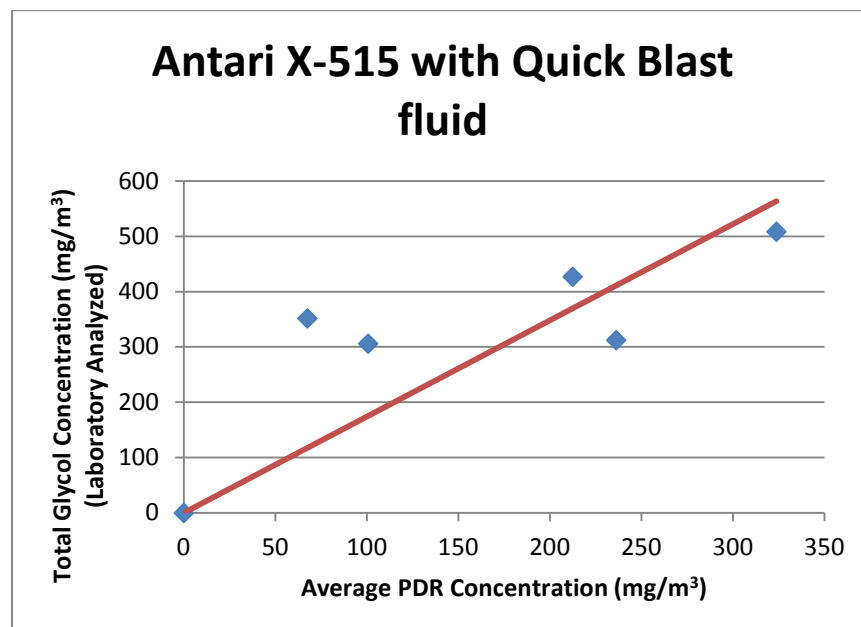
Prepared for Froggy's Fog by ENVIRON International Corporation

ENVIRON developed calibration factors and Time-and-Distance guidelines for the use of Froggy's Fog Quick Blast fluid in a Antari X-515 fog generator.

Quick Blast is a glycol-based fog fluid. Calibration factors were developed to allow a Thermo Scientific PDR-1000 aerosol monitor to be used to measure concentrations glycols in the air after being released from the X-515.

The measured concentrations should be compared against the peak exposure guidance level for glycols, which is 40 mg/m<sup>3</sup>.

The calibration curve for glycols is shown below:



**Figure 1.** Calibration curve for Antari X-515 with Quick Blast fluid, based on glycol laboratory data. Calibration factor, based on slope of curve, is 1.74 (mg/m<sup>3</sup> glycol) / (mg/m<sup>3</sup> aerosol).

Summary of Calibration Factor				
Manufacturer	Machine	Fluid	Fluid Type	Calibration Factor
Antari	X-515	Quick Blast	Glycol	1.74

**Time and Distance Guidelines.** For various distances from the cue release point, the following table provides the average time (in seconds) after the end of the cue release after which the glycol concentrations will have fallen below the guidance levels. Thus, in order to prevent peak exposures to actors, the blocking and choreography should be arranged such that actors are not situated within a particular distance from the front of the fog release point until the amount of time listed in this table has elapsed following the end of the cue. For example, if a production is using the Antari X-515/Quick Blast combination at 100% output with 15-second cue duration, an actor should not be situated within five feet from the front of the cue release point until at least 20 seconds following the end of the cue release.

Summary of Time-and-Distance Guidelines for Fog Generation						
Antari X-515 with Quick Blast Fluid						
Release Duration (secs)	Time (in sec) After Which Air Concentrations Are Below Guidance Level (40 mg/m <sup>3</sup> )					
	Machine Setting	5 ft	10 ft	15 ft	20 ft	25 ft
5	100%	0	0	0	0	0
15	100%	20	0	0	0	0
30*	100%	20	20	0	0	0
30	65%	20	10	0	0	0
60	65%	20	10	0	0	0
120	65%	20	10	0	0	0
60	25%	0	0	0	0	0
120	25%	0	0	0	0	0

\*Machine ran at reduced output volume after 20 seconds

It should be reiterated that the Time-and-Distance Guidelines provided above are intended to allow a production to use the tested equipment and fluid combinations without conducting monitoring. However, these Guidelines may not be appropriate for all productions. Productions may want to use different configurations for positioning the machine (e.g., different heights), provide on-stage ventilation, or generate fog for a shorter or longer period of time. In addition, many productions may have other stage-specific conditions (e.g., on-stage activities and props that enhance dispersion) that would allow actors to be present in areas that are restricted under these Guidelines but which, in fact, do not exceed the guidance levels. In those cases, production-specific monitoring would be recommended to evaluate whether peak exposure may occur.





## Calibration Factor and Time-and-Distance Guidelines

### Antari X-515 with Velocity Fluid

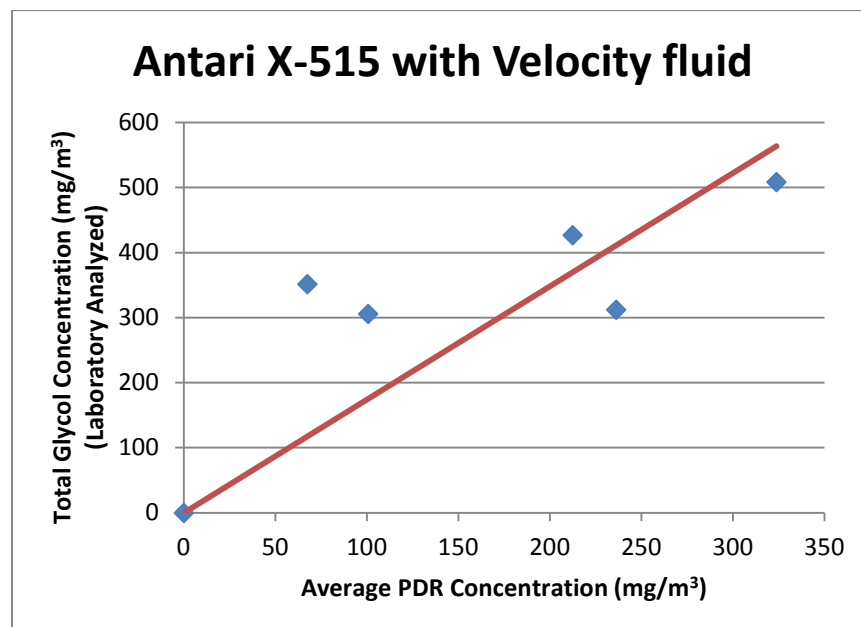
Prepared for Froggy's Fog by ENVIRON International Corporation

ENVIRON developed calibration factors and Time-and-Distance guidelines for the use of Froggy's Fog Velocity fluid in a Antari X-515 fog generator.

Velocity is a glycol-based fog fluid. Calibration factors were developed to allow a Thermo Scientific PDR-1000 aerosol monitor to be used to measure concentrations glycols in the air after being released from the X-515.

The measured concentrations should be compared against the peak exposure guidance level for glycols, which is 40 mg/m<sup>3</sup>.

The calibration curve for glycols is shown below:



**Figure 1.** Calibration curve for Antari X-515 with Velocity fluid, based on glycol laboratory data. Calibration factor, based on slope of curve, is 1.74 (mg/m<sup>3</sup> glycol) / (mg/m<sup>3</sup> aerosol).

Summary of Calibration Factor				
Manufacturer	Machine	Fluid	Fluid Type	Calibration Factor
Antari	X-515	Velocity	Glycol	1.74

**Time and Distance Guidelines.** For various distances from the cue release point, the following table provides the average time (in seconds) after the end of the cue release after which the glycol concentrations will have fallen below the guidance levels. Thus, in order to prevent peak exposures to actors, the blocking and choreography should be arranged such that actors are not situated within a particular distance from the front of the fog release point until the amount of time listed in this table has elapsed following the end of the cue. For example, if a production is using the Antari X-515/Velocity combination at 100% output with 15-second cue duration, an actor should not be situated within five feet from the front of the cue release point until at least 20 seconds following the end of the cue release.

Summary of Time-and-Distance Guidelines for Fog Generation Antari X-515 with Velocity Fluid						
Release Duration (secs)	Time (in sec) After Which Air Concentrations Are Below Guidance Level (40 mg/m <sup>3</sup> )					
	Machine Setting	5 ft	10 ft	15 ft	20 ft	25 ft
5	100%	0	0	0	0	0
15	100%	20	0	0	0	0
30*	100%	20	20	0	0	0
30	65%	20	10	0	0	0
60	65%	20	10	0	0	0
120	65%	20	10	0	0	0
60	25%	0	0	0	0	0
120	25%	0	0	0	0	0

\*Machine ran at reduced output volume after 20 seconds

It should be reiterated that the Time-and-Distance Guidelines provided above are intended to allow a production to use the tested equipment and fluid combinations without conducting monitoring. However, these Guidelines may not be appropriate for all productions. Productions may want to use different configurations for positioning the machine (e.g., different heights), provide on-stage ventilation, or generate fog for a shorter or longer period of time. In addition, many productions may have other stage-specific conditions (e.g., on-stage activities and props that enhance dispersion) that would allow actors to be present in areas that are restricted under these Guidelines but which, in fact, do not exceed the guidance levels. In those cases, production-specific monitoring would be recommended to evaluate whether peak exposure may occur.



## Calibration Factor and Time-and-Distance Guidelines

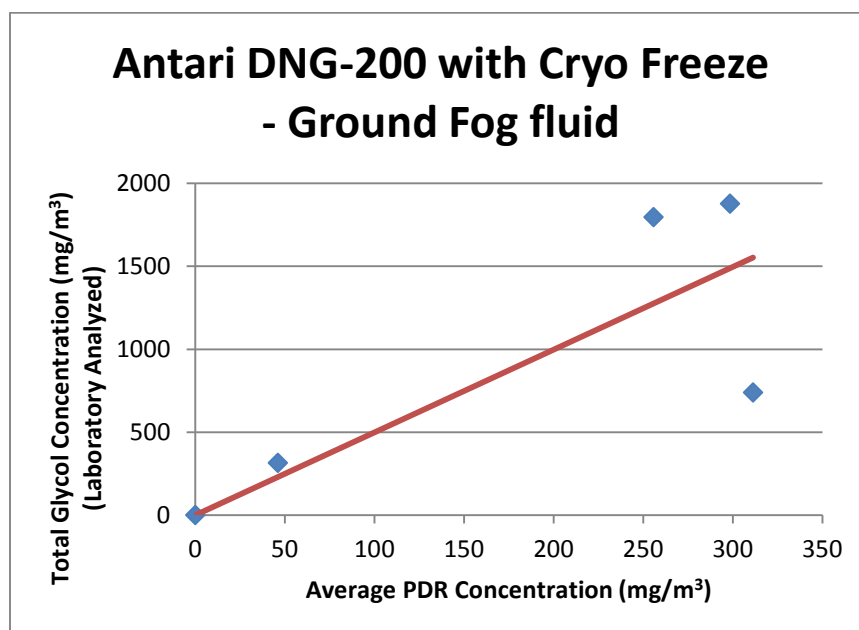
### Antari DNG-200 with Cryo Freeze – Ground Fog Fluid

Prepared for Froggy's Fog by ENVIRON International Corporation

ENVIRON developed calibration factors and Time-and-Distance guidelines for the use of Froggy's Fog Cryo Freeze fluid in an Antari DNG-200 ground fog generator.

Cryo Freeze is a glycol-based fog fluid. Calibration factors were developed to allow a Thermo Scientific PDR-1000 aerosol monitor to be used to measure concentrations glycols in the air after being released from the DNG-200.

The measured concentrations should be compared against the peak exposure guidance level for glycols, which is 40 mg/m<sup>3</sup>. The calibration curve for glycols is shown below:



**Figure 1.** Calibration curve for Antari DNG-200 with Cryo Freeze fluid, based on glycol laboratory data. Calibration factor, based on slope of curve, is 4.99 (mg/m<sup>3</sup> glycol) / (mg/m<sup>3</sup> aerosol)

Summary of Calibration Factor				
Manufacturer	Machine	Fluid	Fluid Type	Calibration Factor
Antari	DNG-200	Cryo Freeze	Glycol	4.99

**Time and Distance Guidelines.** For various horizontal distances from the cue release point, the following table (left) provides the average time (in seconds) after the end of the cue release after which the glycol concentrations will have fallen below the guidance levels. Thus, in order to prevent peak exposures to actors, the blocking and choreography should be arranged such that actors are not situated within a particular distance from the front of the fog release point until the amount of time listed in this table has elapsed following the end of the cue. For example, if a production is using the Antari DNG-200/Cryo Freeze combination with 60-second cue duration, an actor may be standing as little as 5 feet from the front of the cue release point immediately following the end of the cue release. Additional testing was conducted to determine the average time after the end of the cue release after which the glycol concentrations will have fallen below the guidance levels at various heights, as shown in the following table (right). This vertical time and distance testing was conducted in order to better represent actors in various positions onstage, such as lying down, sitting, or kneeling.

Summary of Time-and-Distance Guidelines for Fog Generation - Horizontal Antari DNG-200 with CryoFreeze Fluid						
*Release Duration (secs)	Output Setting	Time (in sec) After Which Air Concentrations Are Below Guidance Level (40 mg/m <sup>3</sup> )				
		5 ft	8 ft	12 ft	16 ft	20 ft
30	Manual	0	0	0	0	0
60	Manual	0	0	0	0	0
30	High	0	0	0	0	0
60	High	0	0	0	0	0
120 <sup>†</sup>	High	0	0	0	0	0
30	Med	0	0	0	0	0
60	Med	0	0	0	0	0
120	Med	0	0	0	0	0
30	Low	0	0	0	0	0
60	Low	0	0	0	0	0
120	Low	0	0	0	0	0

Summary of Time-and-Distance** Guidelines for Fog Generation - Vertical Antari DNG-200 with CryoFreeze Fluid						
*Release Duration (secs)	Output Setting	Time (in sec) After Which Air Concentrations Are Below Guidance Level (40 mg/m <sup>3</sup> )				
		3 in	6 in	18 in	36 in	48 in
30	Manual	20	20	0	0	0
60	Manual	20	20	0	0	0
30	High	30	0	0	0	0
60	High	30	0	0	0	0
120 <sup>†</sup>	High	30	0	0	0	0
30	Med	0	0	0	0	0
60	Med	0	0	0	0	0
120	Med	0	0	0	0	0
30	Low	0	0	0	0	0
60	Low	0	0	0	0	0
120	Low	0	0	0	0	0

\*Machine takes 10 seconds to release fog after turned on

<sup>†</sup>Machine shuts off after 100 seconds

\*\*All concentrations are measured at same horizontal distance from machine (approximately 6 feet).

\*Machine takes 10 seconds to release fog after turned on

<sup>†</sup>Machine shuts off after 100 seconds

It should be reiterated that the Time-and-Distance Guidelines provided above are intended to allow a production to use the tested equipment and fluid combinations without conducting monitoring. However, these Guidelines may not be appropriate for all productions. Productions may want to use different configurations for positioning the machine (e.g., different heights), provide on-stage ventilation, or generate fog for a shorter or longer period of time. In addition, many productions may have other stage-specific conditions (e.g., on-stage activities and props that enhance dispersion) that would allow actors to be present in areas that are restricted under these Guidelines but which, in fact, do not exceed the guidance levels. In those cases, production-specific monitoring would be recommended to evaluate whether peak exposure may occur.



## Calibration Factor and Time-and-Distance Guidelines

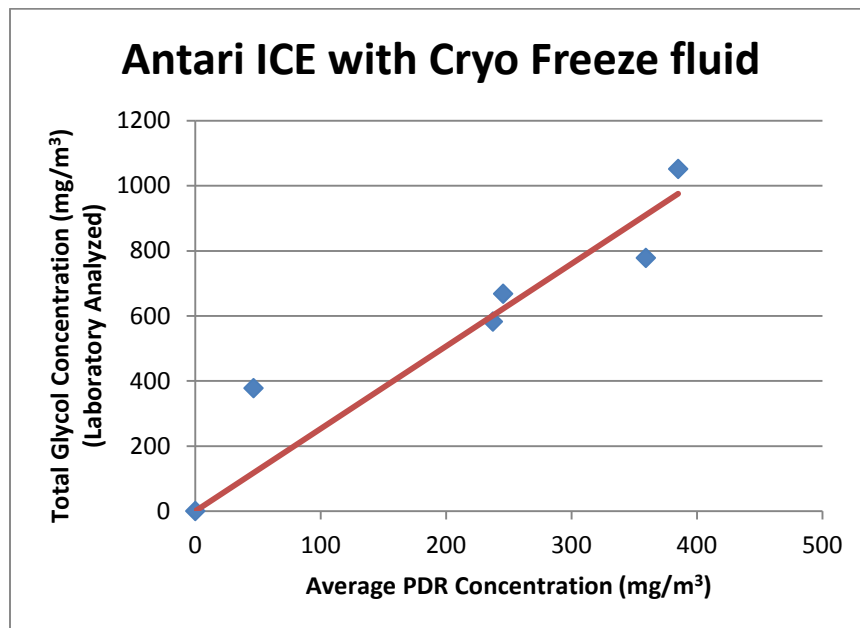
### Antari ICE with Cryo Freeze – Ground Fog Fluid

Prepared for Froggy's Fog by ENVIRON International Corporation

ENVIRON developed calibration factors and Time-and-Distance guidelines for the use of Froggy's Fog Cryo Freeze fluid in an Antari ICE ground fog generator.

Cryo Freeze is a glycol-based fog fluid. Calibration factors were developed to allow a Thermo Scientific PDR-1000 aerosol monitor to be used to measure concentrations glycols in the air after being released from the ICE.

The measured concentrations should be compared against the peak exposure guidance level for glycols, which is 40 mg/m<sup>3</sup>. The calibration curve for glycols is shown below:



**Figure 1.** Calibration curve for Antari ICE with Cryo Freeze fluid, based on glycol laboratory data. Calibration factor, based on slope of curve, is 2.54 (mg/m<sup>3</sup> glycol) / (mg/m<sup>3</sup> aerosol)

Summary of Calibration Factor				
Manufacturer	Machine	Fluid	Fluid Type	Calibration Factor
Antari	ICE	Cryo Freeze	Glycol	2.54

**Time and Distance Guidelines.** For various horizontal distances from the cue release point, the following table (left) provides the average time (in seconds) after the end of the cue release after which the glycol concentrations will have fallen below the guidance levels. Thus, in order to prevent peak exposures to actors, the blocking and choreography should be arranged such that actors are not situated within a particular distance from the front of the fog release point until the amount of time listed in this table has elapsed following the end of the cue. For example, if a production is using the Antari ICE/Cryo Freeze combination with 60-second cue duration, an actor may be standing as little as 5 feet from the front of the cue release point immediately following the end of the cue release. Additional testing was conducted to determine the average time after the end of the cue release after which the glycol concentrations will have fallen below the guidance levels at various heights, as shown in the following table (right). This vertical time and distance testing was conducted in order to better represent actors in various positions onstage, such as lying down, sitting, or kneeling.

Summary of Time-and-Distance Guidelines for Fog Generation - Horizontal						
Antari ICE with Cryo Freeze Fluid						
Release Duration (secs)	Output Setting*	Time (in sec) After Which Air Concentrations Are Below Guidance Level (40 mg/m <sup>3</sup> )				
		5 ft	8 ft	12 ft	16 ft	20 ft
30	High	0	0	0	0	0
60†	High	0	0	0	0	0
120‡	High	0	0	0	0	0
30	Med	0	0	0	0	0
60†	Med	0	0	0	0	0
120‡	Med	0	0	0	0	0

\*Machine does not have visible output at low setting

†Machine turns off for 10 seconds during run

‡Machine turns off for 30 seconds total during run

Summary of Time-and-Distance** Guidelines for Fog Generation - Vertical						
Antari ICE with Cryo Freeze Fluid						
Release Duration (secs)	Output Setting*	Time (in sec) After Which Air Concentrations Are Below Guidance Level (40 mg/m <sup>3</sup> )				
		3 in	6 in	18 in	36 in	48 in
30	High	30	20	0	0	0
60†	High	30	30	0	0	0
120‡	High	30	30	0	0	0
30	Med	20	10	0	0	0
60†	Med	20	10	0	0	0
120‡	Med	30	10	0	0	0

\*\*All concentrations are measured at same horizontal distance from machine (approximately 6 feet).

\*Machine does not have visible output at low setting

†Machine runs off for 10 seconds during run

‡Machine turns off for 30 seconds total during run

It should be reiterated that the Time-and-Distance Guidelines provided above are intended to allow a production to use the tested equipment and fluid combinations without conducting monitoring. However, these Guidelines may not be appropriate for all productions. Productions may want to use different configurations for positioning the machine (e.g., different heights), provide on-stage ventilation, or generate fog for a shorter or longer period of time. In addition, many productions may have other stage-specific conditions (e.g., on-stage activities and props that enhance dispersion) that would allow actors to be present in areas that are restricted under these Guidelines but which, in fact, do not exceed the guidance levels. In those cases, production-specific monitoring would be recommended to evaluate whether peak exposure may occur.



## Calibration Factor and Time-and-Distance Guidelines

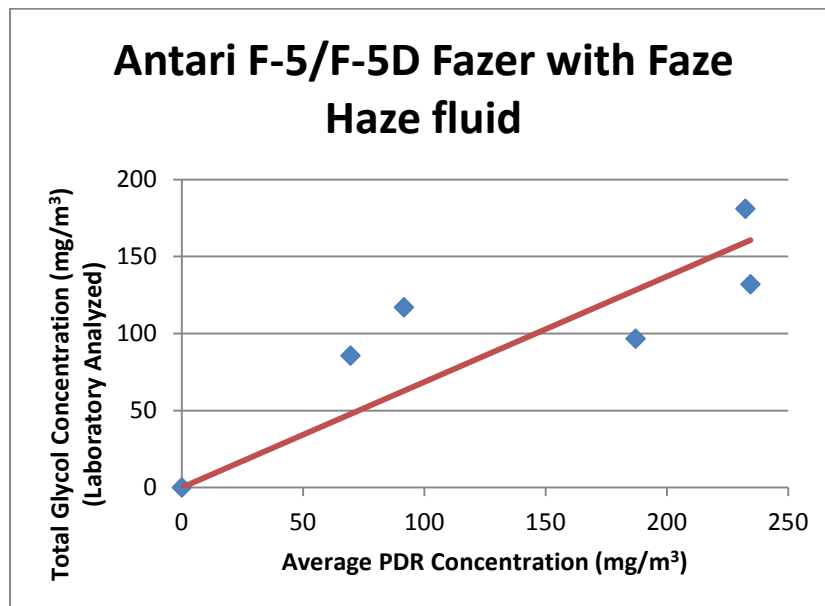
### Antari F-5/F-5D Fazer with Faze Haze Fluid

Prepared for Froggy's Fog by ENVIRON International Corporation

ENVIRON developed calibration factors and Time-and-Distance guidelines for the use of Froggy's Fog Faze Haze fluid in an Antari F-5/F-5D Fazer haze generator.

Faze Haze is a glycol-based fog fluid. Calibration factors were developed to allow a Thermo Scientific PDR-1000 aerosol monitor to be used to measure concentrations glycols in the air after being released from the F-5/F-5D Fazer.

The measured concentrations should be compared against the peak exposure guidance level for glycols, which is 40 mg/m<sup>3</sup>. The calibration curve for glycols is shown below:



**Figure 1.** Calibration curve for Antari F-5/F-5D Fazer with Faze Haze fluid, based on glycol laboratory data. Calibration factor, based on slope of curve, is 0.69 (mg/m<sup>3</sup> glycol) / (mg/m<sup>3</sup> aerosol).

Summary of Calibration Factor				
Manufacturer	Machine	Fluid	Fluid Type	Calibration Factor
Antari	F-5/F-5D Fazer	Faze Haze	Glycol	0.69

**Time and Distance Guidelines.** For various distances from the cue release point, the following table provides the average time (in seconds) after the end of the cue release after which the glycol concentrations will have fallen below the guidance levels. Thus, in order to prevent peak exposures to actors, the blocking and choreography should be arranged such that actors are not situated within a particular distance from the front of the fog release point until the amount of time listed in this table has elapsed following the end of the cue. For example, if a production is using the Antari F-5/F-5D Fazer/Faze Haze combination operating at an output setting of 65 and a fan setting of 50 with 60-second cue duration, an actor should not be situated within five to 15 feet from the front of the cue release point until at least 10 seconds following the end of the cue release.

Summary of Time-and-Distance Guidelines for Fog Generation							
Antari F-5/F-5D Fazer with Faze Haze Fluid							
Release Duration (secs)	Fan Speed	Output Setting	Time (in sec) After Which Air Concentrations Are Below Guidance Level (40 mg/m <sup>3</sup> )				
			5 ft	10 ft	15 ft	20 ft	25 ft
30	100	100	0	0	0	0	0
60	100	100	10	10	10	0	0
120	100	100	10	10	10	0	0
30	100	65	0	0	0	0	0
60	100	65	0	0	0	0	0
120	100	65	0	0	0	0	0
30	100	25	0	0	0	0	0
60	100	25	0	0	0	0	0
120	100	25	0	0	0	0	0
30	50	100	10	10	10	0	0
60	50	100	20	20	20	0	0
120	50	100	20	20	20	0	0
30	50	65	10	10	10	0	0
60	50	65	10	10	10	0	0
120	50	65	10	10	10	0	0
30	20	100	30	30	30	0	0
60	20	100	30	30	30	0	0
120	20	100	30	30	30	0	0
30	20	65	30	30	30	0	0
60	20	65	30	30	30	0	0
120	20	65	30	30	30	0	0

It should be reiterated that the Time-and-Distance Guidelines provided above are intended to allow a production to use the tested equipment and fluid combinations without conducting monitoring. However, these Guidelines may not be appropriate for all productions. Productions may want to use different configurations for positioning the machine (e.g., different heights), provide on-stage ventilation, or generate fog for a shorter or longer period of time. In addition, many productions may have other stage-specific conditions (e.g., on-stage activities and props that enhance dispersion) that would allow actors to be present in areas that are restricted under these Guidelines but which, in fact, do not exceed the guidance levels. In those cases, production-specific monitoring would be recommended to evaluate whether peak exposure may occur.





## Calibration Factor and Time-and-Distance Guidelines

### Antari 1520 RGB Upshot with Quick Blast Fluid

Prepared for Froggy's Fog by ENVIRON International Corporation

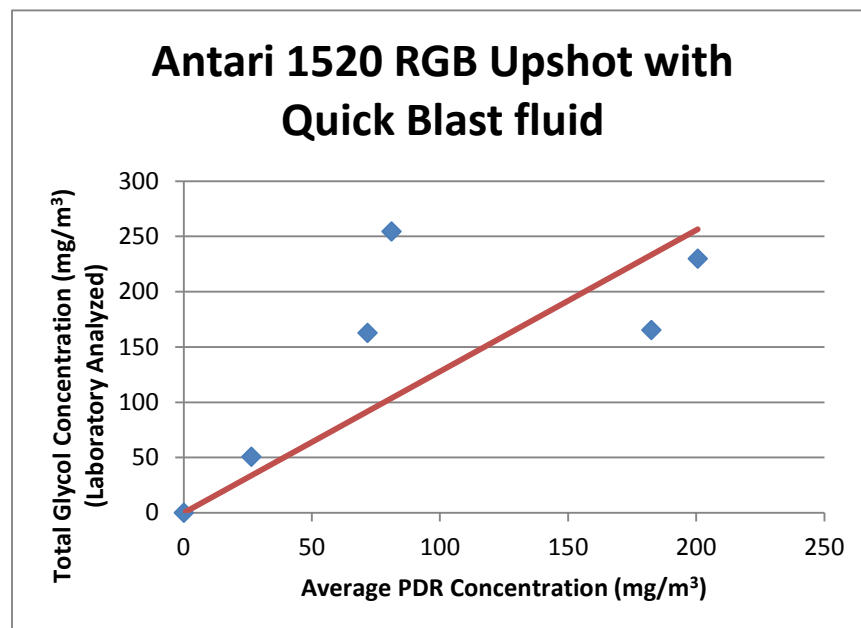
ENVIRON developed calibration factors and Time-and-Distance guidelines for the use of Froggy's Fog Quick Blast fluid in an Antari 1520 RGB Upshot fog generator.

Quick Blast is a glycol-based fog fluid. Calibration factors were developed to allow a Thermo Scientific PDR-1000 aerosol monitor to be used to measure concentrations glycols in the air after being released from the 1520 RGB Upshot.

The measured concentrations should be compared against the peak exposure guidance level for glycols, which is  $40 \text{ mg/m}^3$ .



The calibration curve for glycols is shown below:



**Figure 1.** Calibration curve for Antari 1520 RGB Upshot with Quick Blast fluid, based on glycol laboratory data. Calibration factor, based on slope of curve, is  $1.28 \text{ (mg/m}^3 \text{ glycol) / (mg/m}^3 \text{ aerosol)}$ .

Summary of Calibration Factor				
Manufacturer	Machine	Fluid	Fluid Type	Calibration Factor
Antari	1520 RGB Upshot	Quick Blast	Glycol	1.28

**Time and Distance Guidelines.** For various distances from the cue release point, the following table provides the average time (in seconds) after the end of the cue release after which the glycol concentrations will have fallen below the guidance levels. Thus, in order to prevent peak exposures to actors, the blocking and choreography should be arranged such that actors are not situated within a particular distance from the front of the fog release point until the amount of time listed in this table has elapsed following the end of the cue. For example, if a production is using the Antari 1520 RGB Upshot/Quick Blast combination at full output with 15-second cue duration, an actor should not be situated within five to 20 feet from the front of the cue release point until at least 30 seconds following the end of the cue release. Time-and-Distance testing for the Antari 1520 RGB Upshot was conducted with the machine positioned to shoot fog horizontally rather than vertically.

Summary of Time-and-Distance Guidelines for Fog Generation Antari 1520 RGB Upshot with Quick Blast Fluid						
Release Duration (secs)	Time (in sec) After Which Air Concentrations Are Below Guidance Level (40 mg/m <sup>3</sup> )					
	Machine Setting	5 ft	10 ft	15 ft	20 ft	25 ft
5	Full	30	30	30	30	0
15	Full	30	30	30	30	20
30*	Full	30	30	30	30	20
60*	Full	30	30	30	30	20

\*Machine pulses after 20 seconds

It should be reiterated that the Time-and-Distance Guidelines provided above are intended to allow a production to use the tested equipment and fluid combinations without conducting monitoring. However, these Guidelines may not be appropriate for all productions. Productions may want to use different configurations for positioning the machine (e.g., different heights), provide on-stage ventilation, or generate fog for a shorter or longer period of time. In addition, many productions may have other stage-specific conditions (e.g., on-stage activities and props that enhance dispersion) that would allow actors to be present in areas that are restricted under these Guidelines but which, in fact, do not exceed the guidance levels. In those cases, production-specific monitoring would be recommended to evaluate whether peak exposure may occur.



## Calibration Factor and Time-and-Distance Guidelines

### Antari Z-350 with Beam Splitter Fluid

Prepared for Froggy's Fog by ENVIRON International Corporation

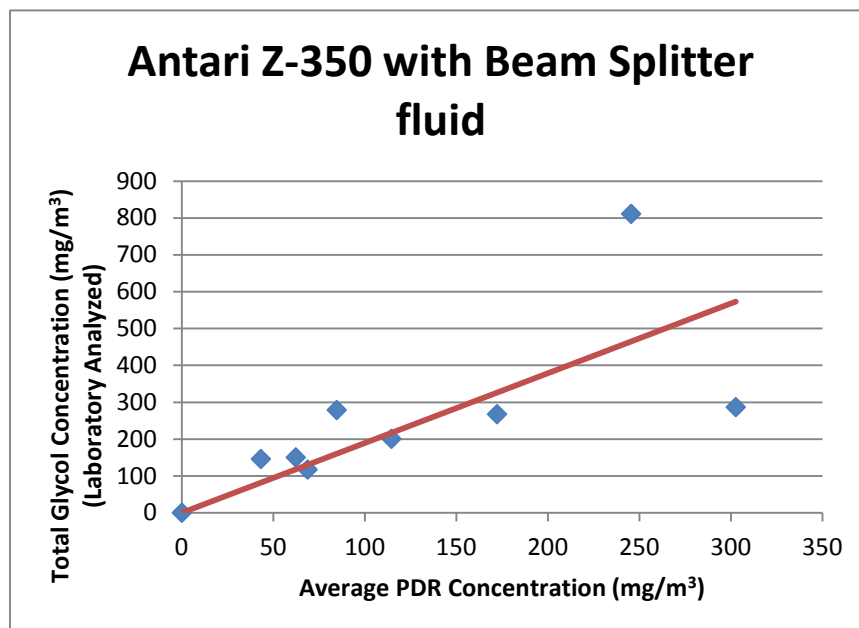
ENVIRON developed calibration factors and Time-and-Distance guidelines for the use of Froggy's Fog Beam Splitter fluid in an Antari Z-350 haze generator.

Beam Splitter is a glycol-based fog fluid. Calibration factors were developed to allow a Thermo Scientific PDR-1000 aerosol monitor to be used to measure concentrations glycols in the air after being released from the Z-350.

The measured concentrations should be compared against the peak exposure guidance level for glycols, which is  $40 \text{ mg/m}^3$ .



The calibration curve for glycols is shown below:



**Figure 1.** Calibration curve for Antari Z-350 with Beam Splitter fluid, based on glycol laboratory data. Calibration factor, based on slope of curve, is  $1.90 \text{ (mg/m}^3 \text{ glycol) / (mg/m}^3 \text{ aerosol)}$ .

Summary of Calibration Factor				
Manufacturer	Machine	Fluid	Fluid Type	Calibration Factor
Antari	Z-350	Beam Splitter	Glycol	1.90

**Time and Distance Guidelines.** For various distances from the cue release point, the following table provides the average time (in seconds) after the end of the cue release after which the glycol concentrations will have fallen below the guidance levels. Thus, in order to prevent peak exposures to actors, the blocking and choreography should be arranged such that actors are not situated within a particular distance from the front of the fog release point until the amount of time listed in this table has elapsed following the end of the cue. For example, if a production is using the Antari Z-350/Beam Splitter combination operating at an output setting of max and a fan setting of ma with 60-second cue duration, an actor should not be situated within two to five feet from the front of the cue release point until at least 10 seconds following the end of the cue release.

Summary of Time-and-Distance Guidelines for Fog Generation							
Antari Z-350 with Beam Splitter Fluid							
Release Duration (secs)	Fan Speed	Output Setting*	Time (in sec) After Which Air Concentrations Are Below Guidance Level (40 mg/m <sup>3</sup> )				
			2 ft	5 ft	10 ft	15 ft	20 ft
30	Max	Max	10	0	0	0	0
60	Max	Max	10	0	0	0	0
120	Max	Max	20	0	0	0	0
30	Max	Middle	0	0	0	0	0
60	Max	Middle	10	0	0	0	0
120	Max	Middle	10	0	0	0	0
30	Middle	Max	20	0	0	0	0
60	Middle	Max	20	0	0	0	0
120	Middle	Max	20	0	0	0	0
30	Middle	Middle	0	0	0	0	0
60	Middle	Middle	10	0	0	0	0
120	Middle	Middle	10	0	0	0	0
30	Min	Max	20	0	0	0	0
60	Min	Max	20	0	0	0	0
120	Min	Max	20	0	0	0	0
30	Min	Middle	20	0	0	0	0
60	Min	Middle	20	0	0	0	0
120	Min	Middle	20	0	0	0	0

\*No output at minimum setting

It should be reiterated that the Time-and-Distance Guidelines provided above are intended to allow a production to use the tested equipment and fluid combinations without conducting monitoring. However, these Guidelines may not be appropriate for all productions. Productions may want to use different configurations for positioning the machine (e.g., different heights), provide on-stage ventilation, or generate fog for a shorter or longer period of time. In addition, many productions may have other stage-specific conditions (e.g., on-stage activities and props that enhance dispersion) that would allow actors to be present in areas that are restricted under these Guidelines but which, in fact, do not exceed the guidance levels. In those cases, production-specific monitoring would be recommended to evaluate whether peak exposure may occur.



## Calibration Factor and Time-and-Distance Guidelines

### Blue Haze Entertainment (BHE) 1550 with Backwood Bay Fluid

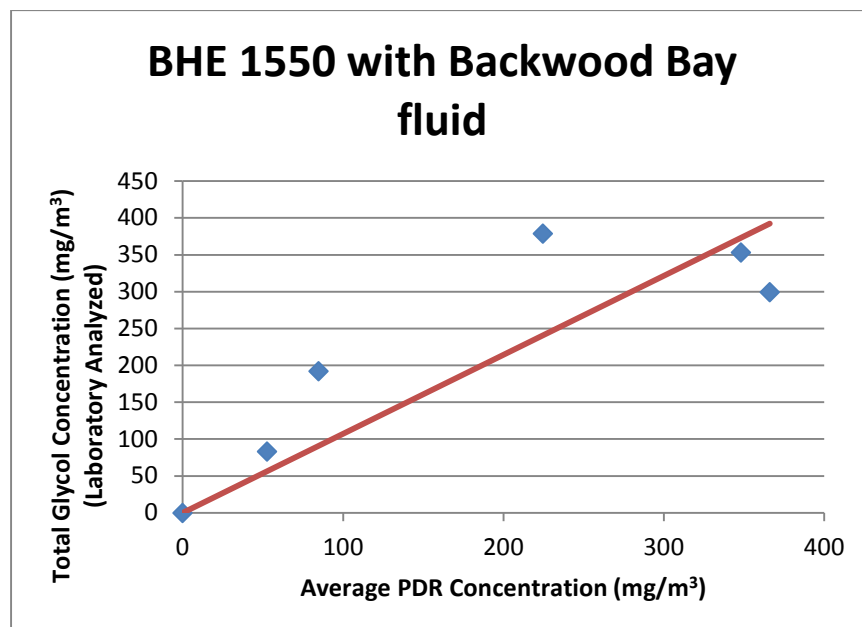
Prepared for Froggy's Fog by ENVIRON International Corporation

ENVIRON developed calibration factors and Time-and-Distance guidelines for the use of Froggy's Fog Backwood Bay fluid in a BHE 1550 fog generator.

Backwood Bay is a glycol-based fog fluid. Calibration factors were developed to allow a Thermo Scientific PDR-1000 aerosol monitor to be used to measure concentrations glycols in the air after being released from the 1550.

The measured concentrations should be compared against the peak exposure guidance level for glycols, which is 40 mg/m<sup>3</sup>.

The calibration curve for glycols is shown below:



**Figure 1.** Calibration curve for BHE 1550 with Backwood Bay fluid, based on glycol laboratory data. Calibration factor, based on slope of curve, is 1.07 (mg/m<sup>3</sup> glycol) / (mg/m<sup>3</sup> aerosol).

Summary of Calibration Factor				
Manufacturer	Machine	Fluid	Fluid Type	Calibration Factor
BHE	1550	Backwood Bay	Glycol	1.07

**Time and Distance Guidelines.** For various distances from the cue release point, the following table provides the average time (in seconds) after the end of the cue release after which the glycol concentrations will have fallen below the guidance levels. Thus, in order to prevent peak exposures to actors, the blocking and choreography should be arranged such that actors are not situated within a particular distance from the front of the fog release point until the amount of time listed in this table has elapsed following the end of the cue. For example, if a production is using the BHE 1550/Backwood Bay combination at 100% output with 30-second cue duration, an actor should not be situated within five to 15 feet from the front of the cue release point until at least 70 seconds following the end of the cue release.

Summary of Time-and-Distance Guidelines for Fog Generation BHE 1550 with Backwood Bay Fluid						
Release Duration (secs)	Time (in sec) After Which Air Concentrations Are Below Guidance Level (40 mg/m <sup>3</sup> )					
	Machine Setting	5 ft	10 ft	15 ft	20 ft	25 ft
5	100%	40	40	40	40	0
15	100%	70	70	70	50	40
30	100%	70	70	70	50	40
30	65%	50	40	40	40	0
60	65%	70	70	40	40	0
120*	65%	70	70	40	40	0
60	25%	60	50	30	0	0
120	25%	60	50	30	0	0

\*Machine ran at reduced output volume after 45 seconds, machine turned off for 37 seconds during run

It should be reiterated that the Time-and-Distance Guidelines provided above are intended to allow a production to use the tested equipment and fluid combinations without conducting monitoring. However, these Guidelines may not be appropriate for all productions. Productions may want to use different configurations for positioning the machine (e.g., different heights), provide on-stage ventilation, or generate fog for a shorter or longer period of time. In addition, many productions may have other stage-specific conditions (e.g., on-stage activities and props that enhance dispersion) that would allow actors to be present in areas that are restricted under these Guidelines but which, in fact, do not exceed the guidance levels. In those cases, production-specific monitoring would be recommended to evaluate whether peak exposure may occur.



## Calibration Factor and Time-and-Distance Guidelines

### Blue Haze Entertainment (BHE) 1550 with Amusement Park Fluid

Prepared for Froggy's Fog by ENVIRON International Corporation

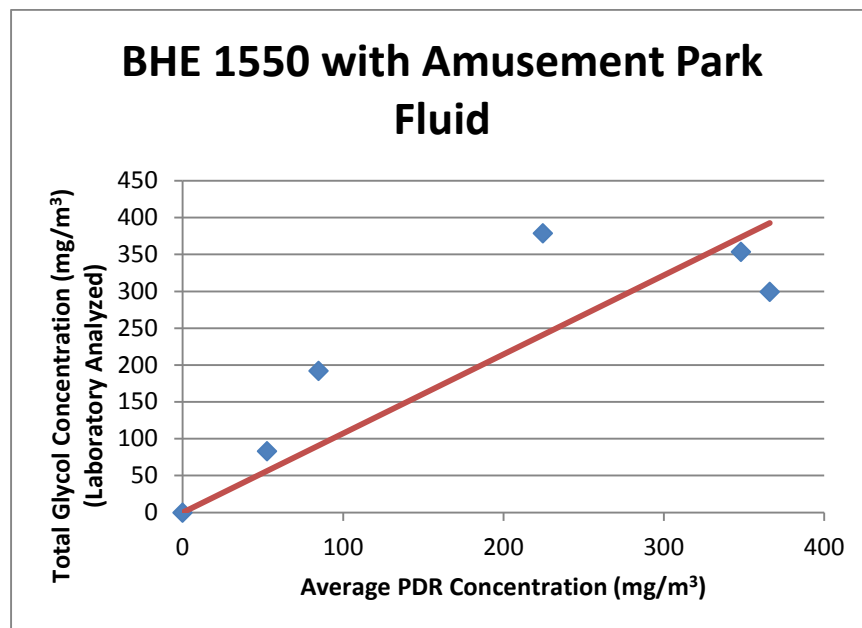
ENVIRON developed calibration factors and Time-and-Distance guidelines for the use of Froggy's Fog Amusement Park Fluid in a BHE 1550 fog generator.

Amusement Park Fluid is a glycol-based fog fluid. Calibration factors were developed to allow a Thermo Scientific PDR-1000 aerosol monitor to be used to measure concentrations glycols in the air after being released from the 1550.

The measured concentrations should be compared against the peak exposure guidance level for glycols, which is 40 mg/m<sup>3</sup>.



The calibration curve for glycols is shown below:



**Figure 1.** Calibration curve for BHE 1550 with Amusement Park Fluid, based on glycol laboratory data. Calibration factor, based on slope of curve, is 1.07 (mg/m<sup>3</sup> glycol) / (mg/m<sup>3</sup> aerosol).

Summary of Calibration Factor				
Manufacturer	Machine	Fluid	Fluid Type	Calibration Factor
BHE	1550	Amusement Park Fluid	Glycol	1.07

**Time and Distance Guidelines.** For various distances from the cue release point, the following table provides the average time (in seconds) after the end of the cue release after which the glycol concentrations will have fallen below the guidance levels. Thus, in order to prevent peak exposures to actors, the blocking and choreography should be arranged such that actors are not situated within a particular distance from the front of the fog release point until the amount of time listed in this table has elapsed following the end of the cue. For example, if a production is using the BHE 1550/Amusement Park Fluid combination at 100% output with 30-second cue duration, an actor should not be situated within five to 15 feet from the front of the cue release point until at least 70 seconds following the end of the cue release.

Summary of Time-and-Distance Guidelines for Fog Generation BHE 1550 with Amusement Park Fluid						
Release Duration (secs)	Time (in sec) After Which Air Concentrations Are Below Guidance Level (40 mg/m <sup>3</sup> )					
	Machine Setting	5 ft	10 ft	15 ft	20 ft	25 ft
5	100%	40	40	40	40	0
15	100%	70	70	70	50	40
30	100%	70	70	70	50	40
30	65%	50	40	40	40	0
60	65%	70	70	40	40	0
120*	65%	70	70	40	40	0
60	25%	60	50	30	0	0
120	25%	60	50	30	0	0

\*Machine ran at reduced output volume after 45 seconds, machine turned off for 37 seconds during run

It should be reiterated that the Time-and-Distance Guidelines provided above are intended to allow a production to use the tested equipment and fluid combinations without conducting monitoring. However, these Guidelines may not be appropriate for all productions. Productions may want to use different configurations for positioning the machine (e.g., different heights), provide on-stage ventilation, or generate fog for a shorter or longer period of time. In addition, many productions may have other stage-specific conditions (e.g., on-stage activities and props that enhance dispersion) that would allow actors to be present in areas that are restricted under these Guidelines but which, in fact, do not exceed the guidance levels. In those cases, production-specific monitoring would be recommended to evaluate whether peak exposure may occur.





## Calibration Factor and Time-and-Distance Guidelines

### Blue Haze Entertainment (BHE) 1550 with Bog Fog Fluid

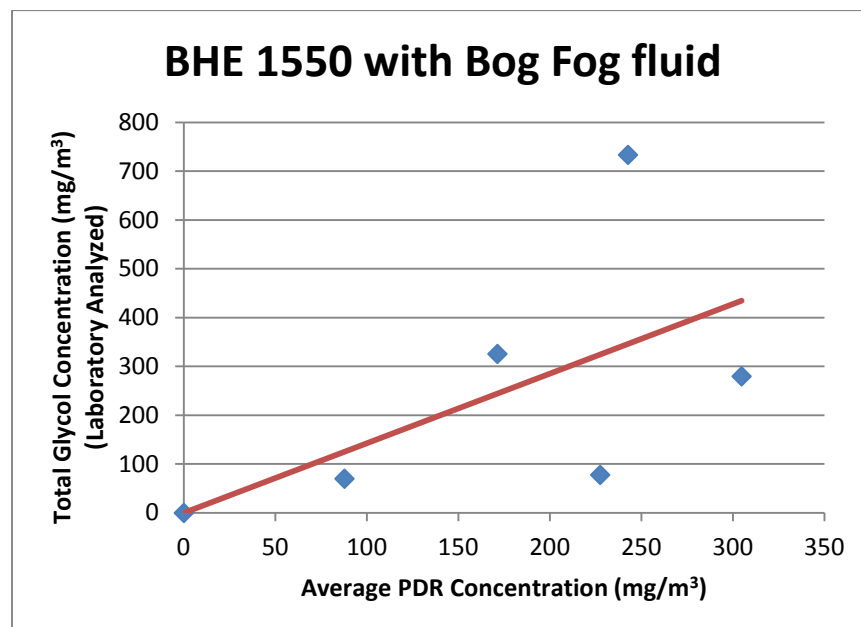
Prepared for Froggy's Fog by ENVIRON International Corporation

ENVIRON developed calibration factors and Time-and-Distance guidelines for the use of Froggy's Fog Bog Fog fluid in a BHE 1550 fog generator.

Bog Fog is a glycol-based fog fluid. Calibration factors were developed to allow a Thermo Scientific PDR-1000 aerosol monitor to be used to measure concentrations glycols in the air after being released from the 1550.

The measured concentrations should be compared against the peak exposure guidance level for glycols, which is 40 mg/m<sup>3</sup>.

The calibration curve for glycols is shown below:



**Figure 1.** Calibration curve for BHE 1550 with Bog Fog fluid, based on glycol laboratory data. Calibration factor, based on slope of curve, is 1.43 (mg/m<sup>3</sup> glycol) / (mg/m<sup>3</sup> aerosol).

Summary of Calibration Factor				
Manufacturer	Machine	Fluid	Fluid Type	Calibration Factor
BHE	1550	Bog Fog	Glycol	1.43

**Time and Distance Guidelines.** For various distances from the cue release point, the following table provides the average time (in seconds) after the end of the cue release after which the glycol concentrations will have fallen below the guidance levels. Thus, in order to prevent peak exposures to actors, the blocking and choreography should be arranged such that actors are not situated within a particular distance from the front of the fog release point until the amount of time listed in this table has elapsed following the end of the cue. For example, if a production is using the BHE 1550/Bog Fog combination at 100% output with 30-second cue duration, an actor should not be situated within five to 10 feet from the front of the cue release point until at least 80 seconds following the end of the cue release.

Summary of Time-and-Distance Guidelines for Fog Generation BHE 1550 with Bog Fog Fluid						
Release Duration (secs)	Time (in sec) After Which Air Concentrations Are Below Guidance Level (40 mg/m <sup>3</sup> )					
	Machine Setting	5 ft	10 ft	15 ft	20 ft	25 ft
5	100%	40	30	0	0	0
15	100%	50	30	0	0	0
30	100%	80	80	70	30	0
30	65%	80	60	50	0	0
60*	65%	80	60	50	30	10
120*	65%	80	60	50	30	10
60	25%	80	40	0	0	0
120†	25%	80	40	0	0	0

\*Machine runs at reduced output volume after 25 seconds

†Machine runs at reduced output volume after 4 seconds

It should be reiterated that the Time-and-Distance Guidelines provided above are intended to allow a production to use the tested equipment and fluid combinations without conducting monitoring. However, these Guidelines may not be appropriate for all productions. Productions may want to use different configurations for positioning the machine (e.g., different heights), provide on-stage ventilation, or generate fog for a shorter or longer period of time. In addition, many productions may have other stage-specific conditions (e.g., on-stage activities and props that enhance dispersion) that would allow actors to be present in areas that are restricted under these Guidelines but which, in fact, do not exceed the guidance levels. In those cases, production-specific monitoring would be recommended to evaluate whether peak exposure may occur.



## Calibration Factor and Time-and-Distance Guidelines

### Blue Haze Entertainment (BHE) 1550 with Velocity Fluid

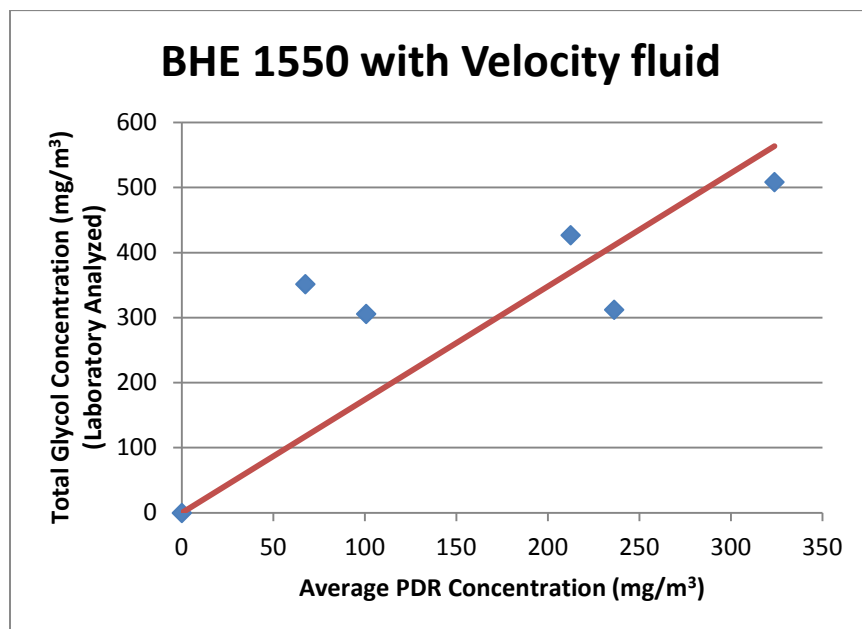
Prepared for Froggy's Fog by ENVIRON International Corporation

ENVIRON developed calibration factors and Time-and-Distance guidelines for the use of Froggy's Fog Velocity fluid in a BHE 1550 fog generator.

Velocity is a glycol-based fog fluid. Calibration factors were developed to allow a Thermo Scientific PDR-1000 aerosol monitor to be used to measure concentrations glycols in the air after being released from the 1550.

The measured concentrations should be compared against the peak exposure guidance level for glycols, which is 40 mg/m<sup>3</sup>.

The calibration curve for glycols is shown below:



**Figure 1.** Calibration curve for BHE 1550 with Velocity fluid, based on glycol laboratory data. Calibration factor, based on slope of curve, is 1.74 (mg/m<sup>3</sup> glycol) / (mg/m<sup>3</sup> aerosol).

Summary of Calibration Factor				
Manufacturer	Machine	Fluid	Fluid Type	Calibration Factor
BHE	1550	Velocity	Glycol	1.74

**Time and Distance Guidelines.** For various distances from the cue release point, the following table provides the average time (in seconds) after the end of the cue release after which the glycol concentrations will have fallen below the guidance levels. Thus, in order to prevent peak exposures to actors, the blocking and choreography should be arranged such that actors are not situated within a particular distance from the front of the fog release point until the amount of time listed in this table has elapsed following the end of the cue. For example, if a production is using the BHE 1550/Velocity combination at 100% output with 15-second cue duration, an actor should not be situated within five feet from the front of the cue release point until at least 20 seconds following the end of the cue release.

Summary of Time-and-Distance Guidelines for Fog Generation BHE 1550 with Velocity Fluid						
Release Duration (secs)	Time (in sec) After Which Air Concentrations Are Below Guidance Level (40 mg/m <sup>3</sup> )					
	Machine Setting	5 ft	10 ft	15 ft	20 ft	25 ft
5	100%	0	0	0	0	0
15	100%	20	0	0	0	0
30*	100%	20	20	0	0	0
30	65%	20	10	0	0	0
60	65%	20	10	0	0	0
120	65%	20	10	0	0	0
60	25%	0	0	0	0	0
120	25%	0	0	0	0	0

\*Machine ran at reduced output volume after 20 seconds

It should be reiterated that the Time-and-Distance Guidelines provided above are intended to allow a production to use the tested equipment and fluid combinations without conducting monitoring. However, these Guidelines may not be appropriate for all productions. Productions may want to use different configurations for positioning the machine (e.g., different heights), provide on-stage ventilation, or generate fog for a shorter or longer period of time. In addition, many productions may have other stage-specific conditions (e.g., on-stage activities and props that enhance dispersion) that would allow actors to be present in areas that are restricted under these Guidelines but which, in fact, do not exceed the guidance levels. In those cases, production-specific monitoring would be recommended to evaluate whether peak exposure may occur.



## Calibration Factor and Time-and-Distance Guidelines

### Blue Haze Entertainment (BHE) 1550 with Cryo Freeze Fluid

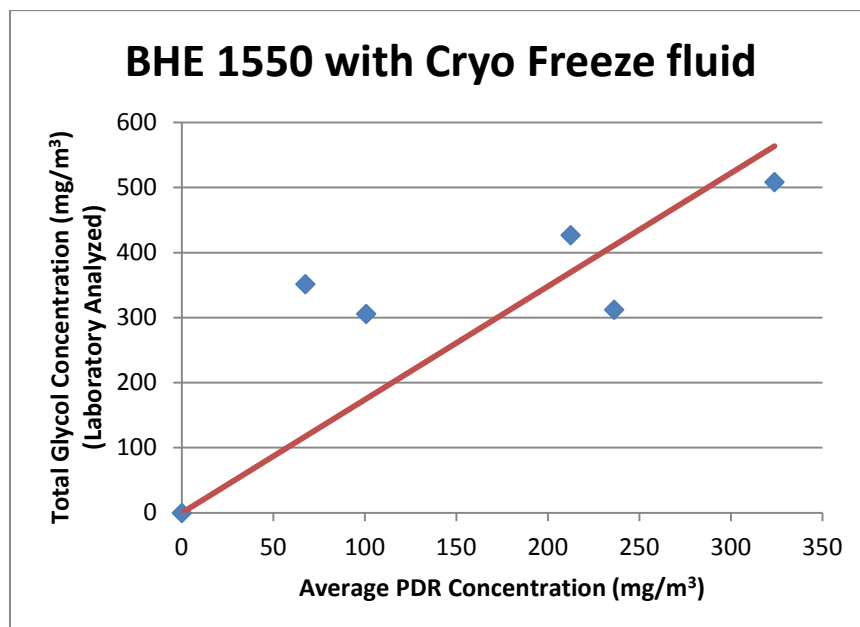
Prepared for Froggy's Fog by ENVIRON International Corporation

ENVIRON developed calibration factors and Time-and-Distance guidelines for the use of Froggy's Fog Cryo Freeze fluid in a BHE 1550 fog generator.

Cryo Freeze is a glycol-based fog fluid. Calibration factors were developed to allow a Thermo Scientific PDR-1000 aerosol monitor to be used to measure concentrations glycols in the air after being released from the 1550.

The measured concentrations should be compared against the peak exposure guidance level for glycols, which is 40 mg/m<sup>3</sup>.

The calibration curve for glycols is shown below:



**Figure 1.** Calibration curve for BHE 1550 with Cryo Freeze fluid, based on glycol laboratory data. Calibration factor, based on slope of curve, is 1.74 (mg/m<sup>3</sup> glycol) / (mg/m<sup>3</sup> aerosol).

Summary of Calibration Factor				
Manufacturer	Machine	Fluid	Fluid Type	Calibration Factor
BHE	1550	Cryo Freeze	Glycol	1.74

**Time and Distance Guidelines.** For various distances from the cue release point, the following table provides the average time (in seconds) after the end of the cue release after which the glycol concentrations will have fallen below the guidance levels. Thus, in order to prevent peak exposures to actors, the blocking and choreography should be arranged such that actors are not situated within a particular distance from the front of the fog release point until the amount of time listed in this table has elapsed following the end of the cue. For example, if a production is using the BHE 1550/Cryo Freeze combination at 100% output with 15-second cue duration, an actor should not be situated within five feet from the front of the cue release point until at least 20 seconds following the end of the cue release.

Summary of Time-and-Distance Guidelines for Fog Generation BHE 1550 with Cryo Freeze Fluid						
Release Duration (secs)	Time (in sec) After Which Air Concentrations Are Below Guidance Level (40 mg/m <sup>3</sup> )					
	Machine Setting	5 ft	10 ft	15 ft	20 ft	25 ft
5	100%	0	0	0	0	0
15	100%	20	0	0	0	0
30*	100%	20	20	0	0	0
30	65%	20	10	0	0	0
60	65%	20	10	0	0	0
120	65%	20	10	0	0	0
60	25%	0	0	0	0	0
120	25%	0	0	0	0	0

\*Machine ran at reduced output volume after 20 seconds

It should be reiterated that the Time-and-Distance Guidelines provided above are intended to allow a production to use the tested equipment and fluid combinations without conducting monitoring. However, these Guidelines may not be appropriate for all productions. Productions may want to use different configurations for positioning the machine (e.g., different heights), provide on-stage ventilation, or generate fog for a shorter or longer period of time. In addition, many productions may have other stage-specific conditions (e.g., on-stage activities and props that enhance dispersion) that would allow actors to be present in areas that are restricted under these Guidelines but which, in fact, do not exceed the guidance levels. In those cases, production-specific monitoring would be recommended to evaluate whether peak exposure may occur.



## Calibration Factor and Time-and-Distance Guidelines

### Blue Haze Entertainment (BHE) 1550 with Quick Blast Fluid

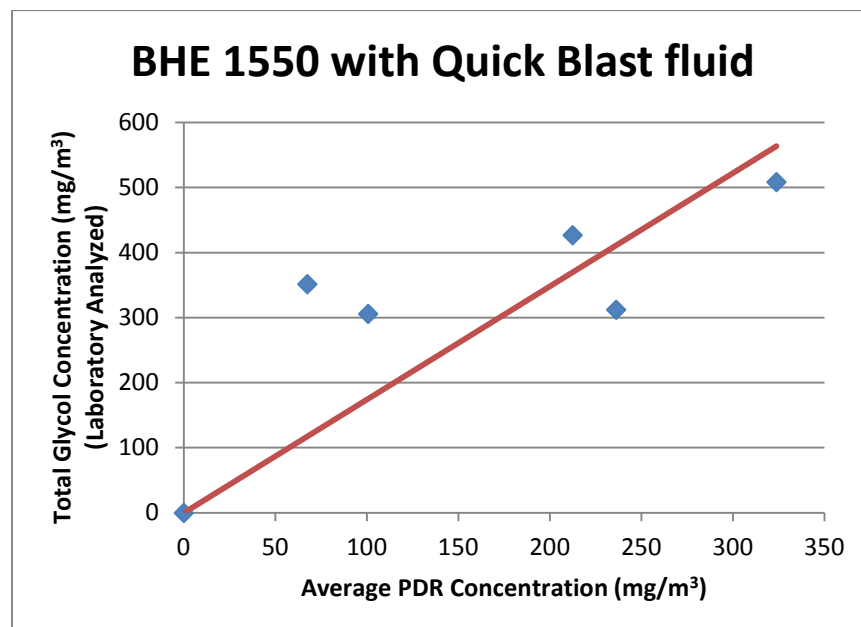
Prepared for Froggy's Fog by ENVIRON International Corporation

ENVIRON developed calibration factors and Time-and-Distance guidelines for the use of Froggy's Fog Quick Blast fluid in a BHE 1550 fog generator.

Quick Blast is a glycol-based fog fluid. Calibration factors were developed to allow a Thermo Scientific PDR-1000 aerosol monitor to be used to measure concentrations glycols in the air after being released from the 1550.

The measured concentrations should be compared against the peak exposure guidance level for glycols, which is 40 mg/m<sup>3</sup>.

The calibration curve for glycols is shown below:



**Figure 1.** Calibration curve for BHE 1550 with Quick Blast fluid, based on glycol laboratory data. Calibration factor, based on slope of curve, is 1.74 (mg/m<sup>3</sup> glycol) / (mg/m<sup>3</sup> aerosol).

Summary of Calibration Factor				
Manufacturer	Machine	Fluid	Fluid Type	Calibration Factor
BHE	1550	Quick Blast	Glycol	1.74

**Time and Distance Guidelines.** For various distances from the cue release point, the following table provides the average time (in seconds) after the end of the cue release after which the glycol concentrations will have fallen below the guidance levels. Thus, in order to prevent peak exposures to actors, the blocking and choreography should be arranged such that actors are not situated within a particular distance from the front of the fog release point until the amount of time listed in this table has elapsed following the end of the cue. For example, if a production is using the BHE 1550/Quick Blast combination at 100% output with 15-second cue duration, an actor should not be situated within five feet from the front of the cue release point until at least 20 seconds following the end of the cue release.

Summary of Time-and-Distance Guidelines for Fog Generation BHE 1550 with Quick Blast Fluid						
Release Duration (secs)	Time (in sec) After Which Air Concentrations Are Below Guidance Level (40 mg/m <sup>3</sup> )					
	Machine Setting	5 ft	10 ft	15 ft	20 ft	25 ft
5	100%	0	0	0	0	0
15	100%	20	0	0	0	0
30*	100%	20	20	0	0	0
30	65%	20	10	0	0	0
60	65%	20	10	0	0	0
120	65%	20	10	0	0	0
60	25%	0	0	0	0	0
120	25%	0	0	0	0	0

\*Machine ran at reduced output volume after 20 seconds

It should be reiterated that the Time-and-Distance Guidelines provided above are intended to allow a production to use the tested equipment and fluid combinations without conducting monitoring. However, these Guidelines may not be appropriate for all productions. Productions may want to use different configurations for positioning the machine (e.g., different heights), provide on-stage ventilation, or generate fog for a shorter or longer period of time. In addition, many productions may have other stage-specific conditions (e.g., on-stage activities and props that enhance dispersion) that would allow actors to be present in areas that are restricted under these Guidelines but which, in fact, do not exceed the guidance levels. In those cases, production-specific monitoring would be recommended to evaluate whether peak exposure may occur.





## Calibration Factor and Time-and-Distance Guidelines

### Chauvet 1800 Flex with Backwood Bay Fluid

Prepared for Froggy's Fog by ENVIRON International Corporation

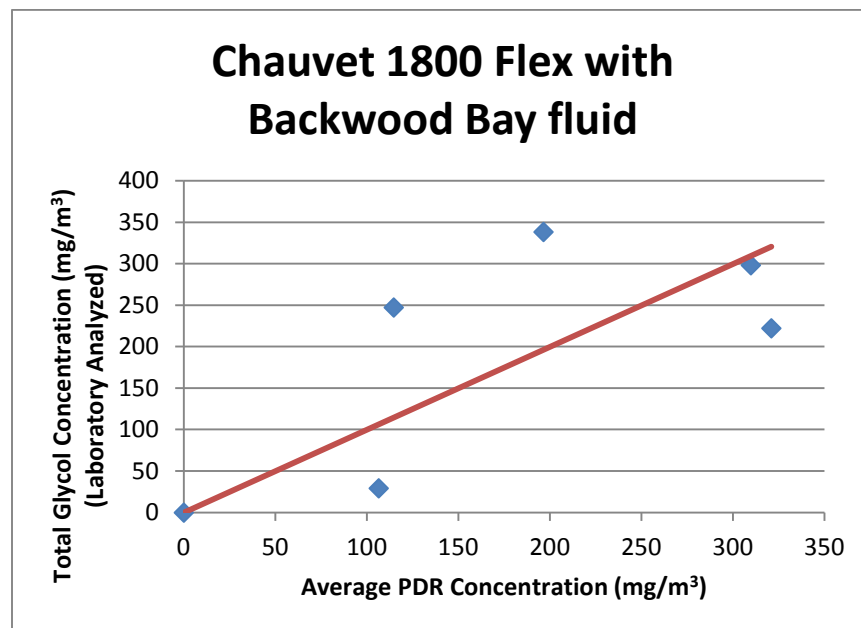
ENVIRON developed calibration factors and Time-and-Distance guidelines for the use of Froggy's Fog Backwood Bay fluid in a Chauvet 1800 Flex fog generator.

Backwood Bay is a glycol-based fog fluid. Calibration factors were developed to allow a Thermo Scientific PDR-1000 aerosol monitor to be used to measure concentrations glycols in the air after being released from the 1800 Flex.

The measured concentrations should be compared against the peak exposure guidance level for glycols, which is 40 mg/m<sup>3</sup>.



The calibration curve for glycols is shown below:



**Figure 1.** Calibration curve for Chauvet 1800 Flex with Backwood Bay fluid, based on glycol laboratory data. Calibration factor, based on slope of curve, is 1.00 (mg/m<sup>3</sup> glycol) / (mg/m<sup>3</sup> aerosol).

<b>Summary of Calibration Factor</b>				
<b>Manufacturer</b>	<b>Machine</b>	<b>Fluid</b>	<b>Fluid Type</b>	<b>Calibration Factor</b>
Chauvet	1800 Flex	Backwood Bay	Glycol	1.00

**Time and Distance Guidelines.** For various distances from the cue release point, the following table provides the average time (in seconds) after the end of the cue release after which the glycol concentrations will have fallen below the guidance levels. Thus, in order to prevent peak exposures to actors, the blocking and choreography should be arranged such that actors are not situated within a particular distance from the front of the fog release point until the amount of time listed in this table has elapsed following the end of the cue. For example, if a production is using the Chauvet 1800 Flex/Backwood Bay combination at full output with 15-second cue duration, an actor should not be situated within five to 25 feet from the front of the cue release point until at least 40 seconds following the end of the cue release.

<b>Summary of Time-and-Distance Guidelines for Fog Generation Chauvet 1800 Flex with Backwood Bay Fluid</b>						
<b>Release Duration (secs)</b>	<b>Time (in sec) After Which Air Concentrations Are Below Guidance Level (40 mg/m<sup>3</sup>)</b>					
	<b>Machine Setting</b>	<b>5 ft</b>	<b>10 ft</b>	<b>15 ft</b>	<b>20 ft</b>	<b>25 ft</b>
5	Full	40	40	30	30	30
15	Full	40	40	40	40	40
30*	Full	60	60	50	50	40
60*	Full	60	60	50	50	40
120*	Full	60	60	50	50	50

\*Machine ran at reduced output volume after 18 seconds

It should be reiterated that the Time-and-Distance Guidelines provided above are intended to allow a production to use the tested equipment and fluid combinations without conducting monitoring. However, these Guidelines may not be appropriate for all productions. Productions may want to use different configurations for positioning the machine (e.g., different heights), provide on-stage ventilation, or generate fog for a shorter or longer period of time. In addition, many productions may have other stage-specific conditions (e.g., on-stage activities and props that enhance dispersion) that would allow actors to be present in areas that are restricted under these Guidelines but which, in fact, do not exceed the guidance levels. In those cases, production-specific monitoring would be recommended to evaluate whether peak exposure may occur.



## Calibration Factor and Time-and-Distance Guidelines

### Chauvet 1800 Flex with Amusement Park Fluid

Prepared for Froggy's Fog by ENVIRON International Corporation

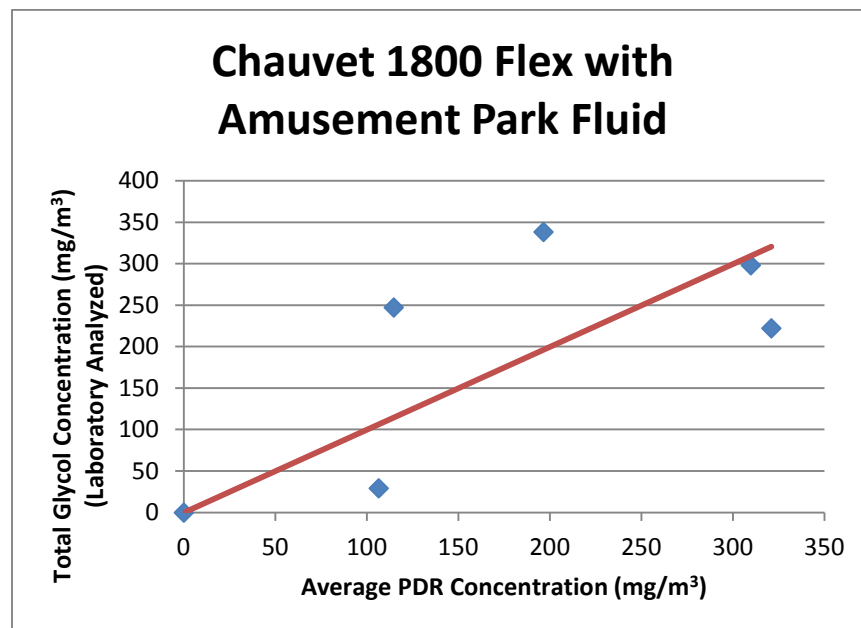
ENVIRON developed calibration factors and Time-and-Distance guidelines for the use of Froggy's Fog Amusement Park Fluid in a Chauvet 1800 Flex fog generator.

Amusement Park Fluid is a glycol-based fog fluid. Calibration factors were developed to allow a Thermo Scientific PDR-1000 aerosol monitor to be used to measure concentrations glycols in the air after being released from the 1800 Flex.

The measured concentrations should be compared against the peak exposure guidance level for glycols, which is 40 mg/m<sup>3</sup>.



The calibration curve for glycols is shown below:



**Figure 1.** Calibration curve for Chauvet 1800 Flex with Amusement Park Fluid, based on glycol laboratory data. Calibration factor, based on slope of curve, is 1.00 (mg/m<sup>3</sup> glycol) / (mg/m<sup>3</sup> aerosol).

Summary of Calibration Factor				
Manufacturer	Machine	Fluid	Fluid Type	Calibration Factor
Chauvet	1800 Flex	Amusement Park Fluid	Glycol	1.00

**Time and Distance Guidelines.** For various distances from the cue release point, the following table provides the average time (in seconds) after the end of the cue release after which the glycol concentrations will have fallen below the guidance levels. Thus, in order to prevent peak exposures to actors, the blocking and choreography should be arranged such that actors are not situated within a particular distance from the front of the fog release point until the amount of time listed in this table has elapsed following the end of the cue. For example, if a production is using the Chauvet 1800 Flex/Amusement Park Fluid combination at full output with 15-second cue duration, an actor should not be situated within five to 25 feet from the front of the cue release point until at least 40 seconds following the end of the cue release.

Summary of Time-and-Distance Guidelines for Fog Generation Chauvet 1800 Flex with Amusement Park Fluid						
Release Duration (secs)	Time (in sec) After Which Air Concentrations Are Below Guidance Level (40 mg/m <sup>3</sup> )					
	Machine Setting	5 ft	10 ft	15 ft	20 ft	25 ft
5	Full	40	40	30	30	30
15	Full	40	40	40	40	40
30*	Full	60	60	50	50	40
60*	Full	60	60	50	50	40
120*	Full	60	60	50	50	50

\*Machine ran at reduced output volume after 18 seconds

It should be reiterated that the Time-and-Distance Guidelines provided above are intended to allow a production to use the tested equipment and fluid combinations without conducting monitoring. However, these Guidelines may not be appropriate for all productions. Productions may want to use different configurations for positioning the machine (e.g., different heights), provide on-stage ventilation, or generate fog for a shorter or longer period of time. In addition, many productions may have other stage-specific conditions (e.g., on-stage activities and props that enhance dispersion) that would allow actors to be present in areas that are restricted under these Guidelines but which, in fact, do not exceed the guidance levels. In those cases, production-specific monitoring would be recommended to evaluate whether peak exposure may occur.



## Calibration Factor and Time-and-Distance Guidelines

### Chauvet 1800 Flex with Bog Fog Fluid

Prepared for Froggy's Fog by ENVIRON International Corporation

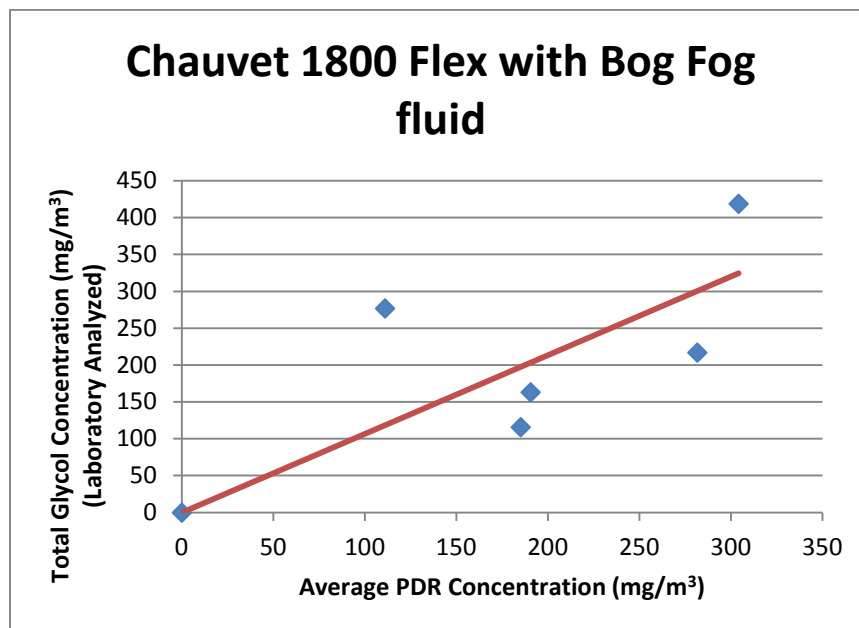
ENVIRON developed calibration factors and Time-and-Distance guidelines for the use of Froggy's Fog Bog Fog fluid in a Chauvet 1800 Flex fog generator.

Bog Fog is a glycol-based fog fluid. Calibration factors were developed to allow a Thermo Scientific PDR-1000 aerosol monitor to be used to measure concentrations glycols in the air after being released from the 1800 Flex.

The measured concentrations should be compared against the peak exposure guidance level for glycols, which is 40 mg/m<sup>3</sup>.



The calibration curve for glycols is shown below:



**Figure 1.** Calibration curve for Chauvet 1800 Flex with Bog Fog fluid, based on glycol laboratory data. Calibration factor, based on slope of curve, is 1.07 (mg/m<sup>3</sup> glycol) / (mg/m<sup>3</sup> aerosol).

Summary of Calibration Factor				
Manufacturer	Machine	Fluid	Fluid Type	Calibration Factor
Chauvet	1800 Flex	Bog Fog	Glycol	1.07

**Time and Distance Guidelines.** For various distances from the cue release point, the following table provides the average time (in seconds) after the end of the cue release after which the glycol concentrations will have fallen below the guidance levels. Thus, in order to prevent peak exposures to actors, the blocking and choreography should be arranged such that actors are not situated within a particular distance from the front of the fog release point until the amount of time listed in this table has elapsed following the end of the cue. For example, if a production is using the Chauvet 1800 Flex/Bog Fog combination at full output with 15-second cue duration, an actor should not be situated within five to 25 feet from the front of the cue release point until at least 70 seconds following the end of the cue release.

Summary of Time-and-Distance Guidelines for Fog Generation Chauvet 1800 Flex with Bog Fog Fluid						
Release Duration (secs)	Time (in sec) After Which Air Concentrations Are Below Guidance Level (40 mg/m <sup>3</sup> )					
	Machine Setting	5 ft	10 ft	15 ft	20 ft	25 ft
5	Full	70	50	40	30	0
15	Full	70	70	70	70	70
30*	Full	90	90	70	70	70
60*	Full	90	90	70	70	70
120*	Full	90	90	70	70	70

\*Machine ran at reduced output volume after 20 seconds

It should be reiterated that the Time-and-Distance Guidelines provided above are intended to allow a production to use the tested equipment and fluid combinations without conducting monitoring. However, these Guidelines may not be appropriate for all productions. Productions may want to use different configurations for positioning the machine (e.g., different heights), provide on-stage ventilation, or generate fog for a shorter or longer period of time. In addition, many productions may have other stage-specific conditions (e.g., on-stage activities and props that enhance dispersion) that would allow actors to be present in areas that are restricted under these Guidelines but which, in fact, do not exceed the guidance levels. In those cases, production-specific monitoring would be recommended to evaluate whether peak exposure may occur.



# Calibration Factor and Time-and-Distance Guidelines

## Chauvet 1800 Flex with Techno Fluid

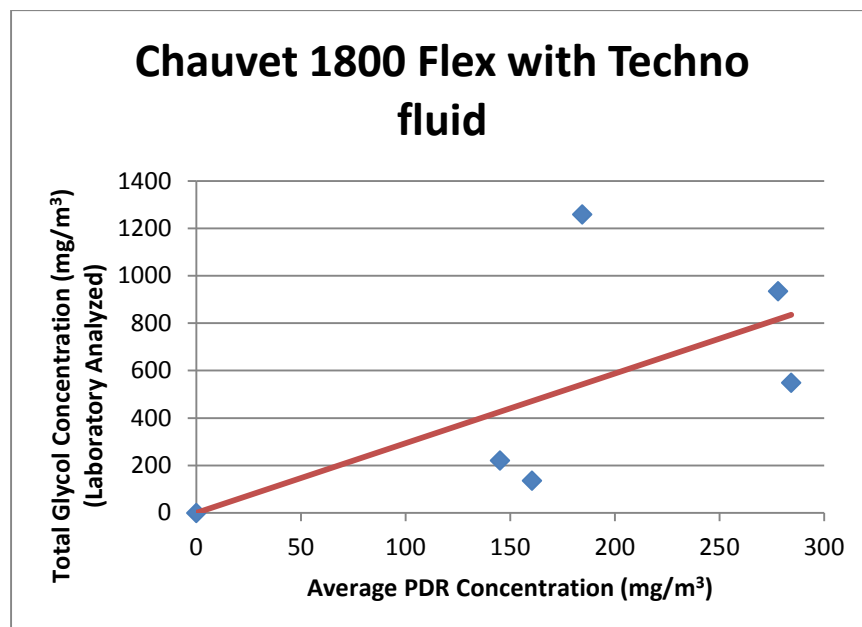
Prepared for Froggy's Fog by ENVIRON International Corporation

ENVIRON developed calibration factors and Time-and-Distance guidelines for the use of Froggy's Fog Techno fluid in a Chauvet 1800 Flex fog generator.

Techno is a glycol-based fog fluid. Calibration factors were developed to allow a Thermo Scientific PDR-1000 aerosol monitor to be used to measure concentrations glycols in the air after being released from the 1800 Flex.

The measured concentrations should be compared against the peak exposure guidance level for glycols, which is 40 mg/m<sup>3</sup>.

The calibration curve for glycols is shown below:



**Figure 1.** Calibration curve for Chauvet 1800 Flex with Techno fluid, based on glycol laboratory data. Calibration factor, based on slope of curve, is 2.94 (mg/m<sup>3</sup> glycol) / (mg/m<sup>3</sup> aerosol).

Summary of Calibration Factor				
Manufacturer	Machine	Fluid	Fluid Type	Calibration Factor
Chauvet	1800 Flex	Techno	Glycol	2.94

**Time and Distance Guidelines.** For various distances from the cue release point, the following table provides the average time (in seconds) after the end of the cue release after which the glycol concentrations will have fallen below the guidance levels. Thus, in order to prevent peak exposures to actors, the blocking and choreography should be arranged such that actors are not situated within a particular distance from the front of the fog release point until the amount of time listed in this table has elapsed following the end of the cue. For example, if a production is using the Chauvet 1800 Flex/Techno combination at full output with 15-second cue duration, an actor should not be situated within seven to 20 feet from the front of the cue release point until at least 30 seconds following the end of the cue release.

Summary of Time-and-Distance Guidelines for Fog Generation Chauvet 1800 Flex with Techno Fluid						
Release Duration (secs)	Output Setting	Time (in sec) After Which Air Concentrations Are Below Guidance Level (40 mg/m <sup>3</sup> )				
		7 ft	15 ft	20 ft	25 ft	30 ft
5	Full	30	30	20	20	0
15*	Full	30	30	30	20	20
30*	Full	50	50	40	40	40
60*	Full	50	50	40	40	40
120*	Full	60	60	60	60	40

\*Machine ran at reduced output volume after 12 seconds

It should be reiterated that the Time-and-Distance Guidelines provided above are intended to allow a production to use the tested equipment and fluid combinations without conducting monitoring. However, these Guidelines may not be appropriate for all productions. Productions may want to use different configurations for positioning the machine (e.g., different heights), provide on-stage ventilation, or generate fog for a shorter or longer period of time. In addition, many productions may have other stage-specific conditions (e.g., on-stage activities and props that enhance dispersion) that would allow actors to be present in areas that are restricted under these Guidelines but which, in fact, do not exceed the guidance levels. In those cases, production-specific monitoring would be recommended to evaluate whether peak exposure may occur.





## Calibration Factor and Time-and-Distance Guidelines

### Chauvet 1800 Flex with Velocity Fluid

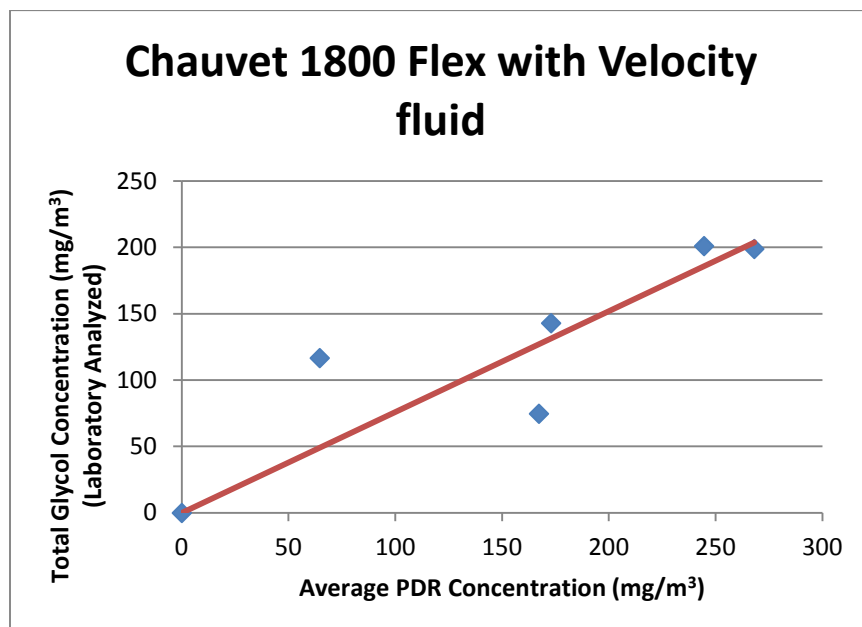
Prepared for Froggy's Fog by ENVIRON International Corporation

ENVIRON developed calibration factors and Time-and-Distance guidelines for the use of Froggy's Fog Velocity fluid in a Chauvet 1800 Flex fog generator.

Velocity is a glycol-based fog fluid. Calibration factors were developed to allow a Thermo Scientific PDR-1000 aerosol monitor to be used to measure concentrations glycols in the air after being released from the 1800 Flex.

The measured concentrations should be compared against the peak exposure guidance level for glycols, which is  $40 \text{ mg/m}^3$ .

The calibration curve for glycols is shown below:



**Figure 1.** Calibration curve for Chauvet 1800 Flex with Velocity fluid, based on glycol laboratory data. Calibration factor, based on slope of curve, is  $0.76 \text{ (mg/m}^3 \text{ glycol) / (mg/m}^3 \text{ aerosol)}$ .

Summary of Calibration Factor				
Manufacturer	Machine	Fluid	Fluid Type	Calibration Factor
Chauvet	1800 Flex	Velocity	Glycol	0.76

**Time and Distance Guidelines.** For various distances from the cue release point, the following table provides the average time (in seconds) after the end of the cue release after which the glycol concentrations will have fallen below the guidance levels. Thus, in order to prevent peak exposures to actors, the blocking and choreography should be arranged such that actors are not situated within a particular distance from the front of the fog release point until the amount of time listed in this table has elapsed following the end of the cue. For example, if a production is using the Chauvet 1800 Flex/Velocity combination at full output with 15-second cue duration, an actor should not be situated within five to 15 feet from the front of the cue release point until at least 30 seconds following the end of the cue release.

Summary of Time-and-Distance Guidelines for Fog Generation Chauvet 1800 Flex with Velocity Fluid						
Release Duration (secs)	Machine Setting	Time (in sec) After Which Air Concentrations Are Below Guidance Level (40 mg/m <sup>3</sup> )				
		5 ft	10 ft	15 ft	20 ft	25 ft
5	Full	30	30	30	0	0
15*	Full	30	30	30	20	0
30*	Full	30	30	30	20	0
60*	Full	30	30	30	20	0
120*	Full	30	30	30	20	0

\*Machine ran at reduced output volume after 10 seconds

It should be reiterated that the Time-and-Distance Guidelines provided above are intended to allow a production to use the tested equipment and fluid combinations without conducting monitoring. However, these Guidelines may not be appropriate for all productions. Productions may want to use different configurations for positioning the machine (e.g., different heights), provide on-stage ventilation, or generate fog for a shorter or longer period of time. In addition, many productions may have other stage-specific conditions (e.g., on-stage activities and props that enhance dispersion) that would allow actors to be present in areas that are restricted under these Guidelines but which, in fact, do not exceed the guidance levels. In those cases, production-specific monitoring would be recommended to evaluate whether peak exposure may occur.



## Calibration Factor and Time-and-Distance Guidelines

### Chauvet 1800 Flex with Cryo Freeze Fluid

Prepared for Froggy's Fog by ENVIRON International Corporation

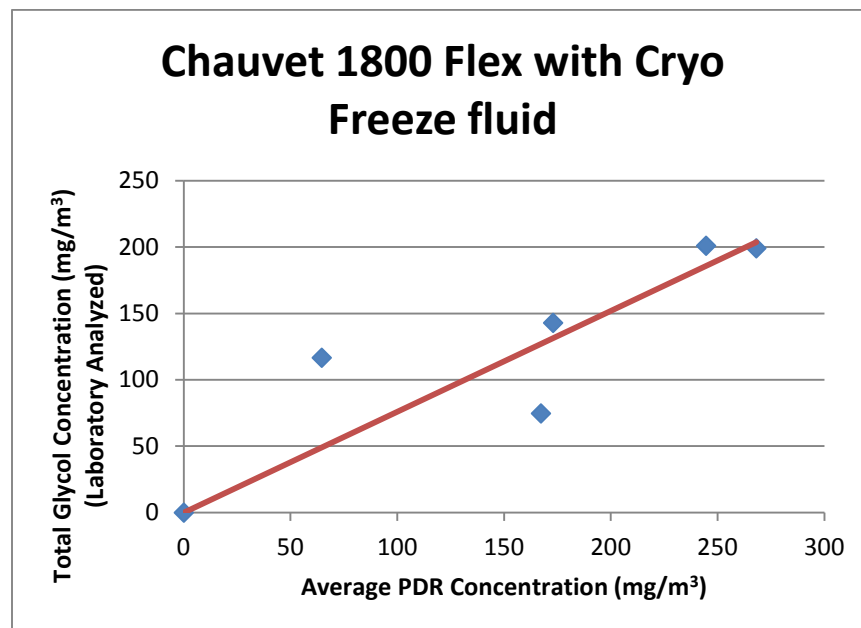
ENVIRON developed calibration factors and Time-and-Distance guidelines for the use of Froggy's Fog Cryo Freeze fluid in a Chauvet 1800 Flex fog generator.

Cryo Freeze is a glycol-based fog fluid. Calibration factors were developed to allow a Thermo Scientific PDR-1000 aerosol monitor to be used to measure concentrations glycols in the air after being released from the 1800 Flex.

The measured concentrations should be compared against the peak exposure guidance level for glycols, which is 40 mg/m<sup>3</sup>.



The calibration curve for glycols is shown below:



**Figure 1.** Calibration curve for Chauvet 1800 Flex with Cryo Freeze fluid, based on glycol laboratory data. Calibration factor, based on slope of curve, is 0.76 (mg/m<sup>3</sup> glycol) / (mg/m<sup>3</sup> aerosol).

Summary of Calibration Factor				
Manufacturer	Machine	Fluid	Fluid Type	Calibration Factor
Chauvet	1800 Flex	Cryo Freeze	Glycol	0.76

**Time and Distance Guidelines.** For various distances from the cue release point, the following table provides the average time (in seconds) after the end of the cue release after which the glycol concentrations will have fallen below the guidance levels. Thus, in order to prevent peak exposures to actors, the blocking and choreography should be arranged such that actors are not situated within a particular distance from the front of the fog release point until the amount of time listed in this table has elapsed following the end of the cue. For example, if a production is using the Chauvet 1800 Flex/Cryo Freeze combination at full output with 15-second cue duration, an actor should not be situated within five to 15 feet from the front of the cue release point until at least 30 seconds following the end of the cue release.

Summary of Time-and-Distance Guidelines for Fog Generation Chauvet 1800 Flex with Cryo Freeze Fluid						
Release Duration (secs)	Machine Setting	Time (in sec) After Which Air Concentrations Are Below Guidance Level (40 mg/m <sup>3</sup> )				
		5 ft	10 ft	15 ft	20 ft	25 ft
5	Full	30	30	30	0	0
15*	Full	30	30	30	20	0
30*	Full	30	30	30	20	0
60*	Full	30	30	30	20	0
120*	Full	30	30	30	20	0

\*Machine ran at reduced output volume after 10 seconds

It should be reiterated that the Time-and-Distance Guidelines provided above are intended to allow a production to use the tested equipment and fluid combinations without conducting monitoring. However, these Guidelines may not be appropriate for all productions. Productions may want to use different configurations for positioning the machine (e.g., different heights), provide on-stage ventilation, or generate fog for a shorter or longer period of time. In addition, many productions may have other stage-specific conditions (e.g., on-stage activities and props that enhance dispersion) that would allow actors to be present in areas that are restricted under these Guidelines but which, in fact, do not exceed the guidance levels. In those cases, production-specific monitoring would be recommended to evaluate whether peak exposure may occur.



# Calibration Factor and Time-and-Distance Guidelines

## Chauvet 1800 Flex with Quick Blast Fluid

Prepared for Froggy's Fog by ENVIRON International Corporation

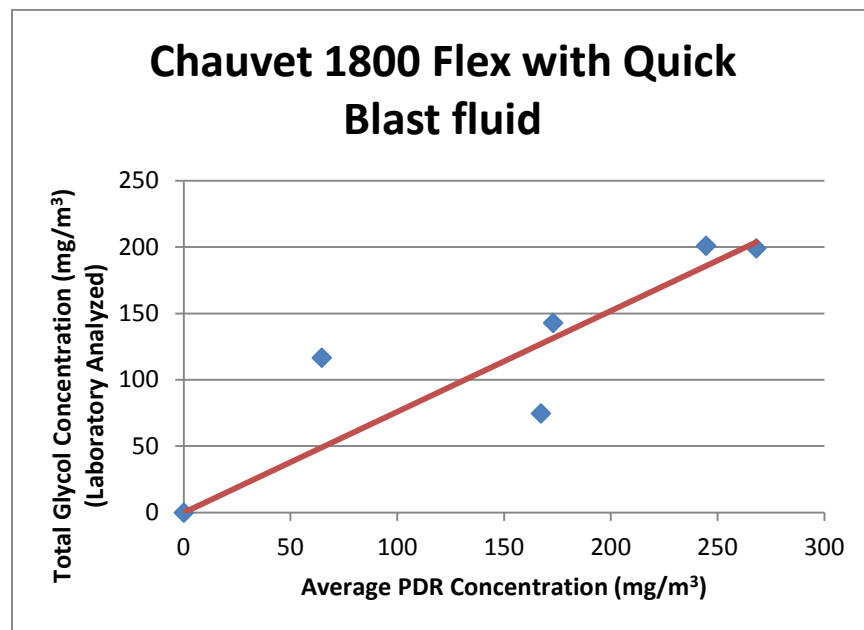
ENVIRON developed calibration factors and Time-and-Distance guidelines for the use of Froggy's Fog Quick Blast fluid in a Chauvet 1800 Flex fog generator.

Quick Blast is a glycol-based fog fluid. Calibration factors were developed to allow a Thermo Scientific PDR-1000 aerosol monitor to be used to measure concentrations glycols in the air after being released from the 1800 Flex.

The measured concentrations should be compared against the peak exposure guidance level for glycols, which is 40 mg/m<sup>3</sup>.



The calibration curve for glycols is shown below:



**Figure 1.** Calibration curve for Chauvet 1800 Flex with Quick Blast fluid, based on glycol laboratory data. Calibration factor, based on slope of curve, is 0.76 (mg/m<sup>3</sup> glycol) / (mg/m<sup>3</sup> aerosol).

Summary of Calibration Factor				
Manufacturer	Machine	Fluid	Fluid Type	Calibration Factor
Chauvet	1800 Flex	Quick Blast	Glycol	0.76

**Time and Distance Guidelines.** For various distances from the cue release point, the following table provides the average time (in seconds) after the end of the cue release after which the glycol concentrations will have fallen below the guidance levels. Thus, in order to prevent peak exposures to actors, the blocking and choreography should be arranged such that actors are not situated within a particular distance from the front of the fog release point until the amount of time listed in this table has elapsed following the end of the cue. For example, if a production is using the Chauvet 1800 Flex/Quick Blast combination at full output with 15-second cue duration, an actor should not be situated within five to 15 feet from the front of the cue release point until at least 30 seconds following the end of the cue release.

Summary of Time-and-Distance Guidelines for Fog Generation Chauvet 1800 Flex with Quick Blast Fluid						
Release Duration (secs)	Machine Setting	Time (in sec) After Which Air Concentrations Are Below Guidance Level (40 mg/m <sup>3</sup> )				
		5 ft	10 ft	15 ft	20 ft	25 ft
5	Full	30	30	30	0	0
15*	Full	30	30	30	20	0
30*	Full	30	30	30	20	0
60*	Full	30	30	30	20	0
120*	Full	30	30	30	20	0

\*Machine ran at reduced output volume after 10 seconds

It should be reiterated that the Time-and-Distance Guidelines provided above are intended to allow a production to use the tested equipment and fluid combinations without conducting monitoring. However, these Guidelines may not be appropriate for all productions. Productions may want to use different configurations for positioning the machine (e.g., different heights), provide on-stage ventilation, or generate fog for a shorter or longer period of time. In addition, many productions may have other stage-specific conditions (e.g., on-stage activities and props that enhance dispersion) that would allow actors to be present in areas that are restricted under these Guidelines but which, in fact, do not exceed the guidance levels. In those cases, production-specific monitoring would be recommended to evaluate whether peak exposure may occur.



# Calibration Factor and Time-and-Distance Guidelines

## Chauvet Geyser with Quick Blast Fluid

Prepared for Froggy's Fog by ENVIRON International Corporation

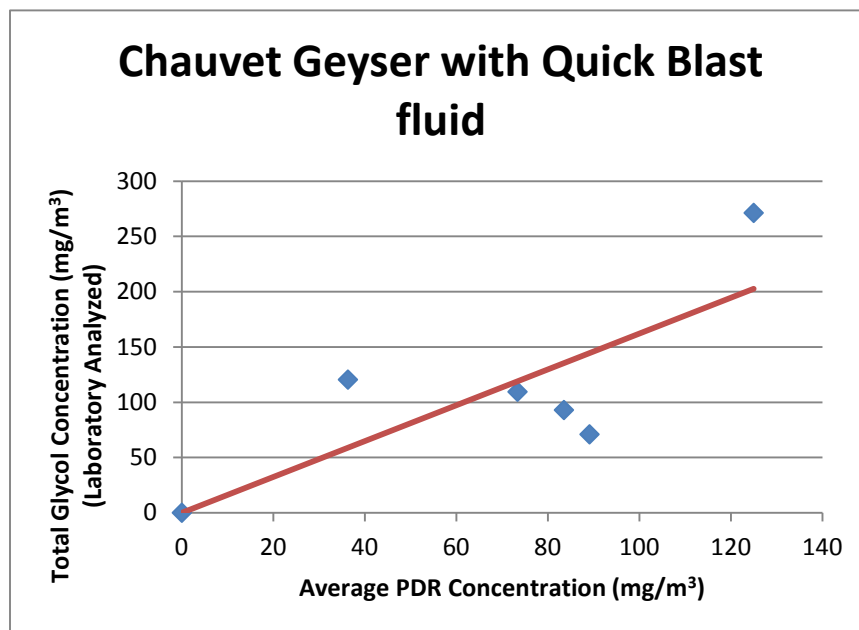
ENVIRON developed calibration factors and Time-and-Distance guidelines for the use of Froggy's Fog Quick Blast fluid in a Chauvet Geyser fog generator.

Quick Blast is a glycol-based fog fluid. Calibration factors were developed to allow a Thermo Scientific PDR-1000 aerosol monitor to be used to measure concentrations glycols in the air after being released from the Geyser.

The measured concentrations should be compared against the peak exposure guidance level for glycols, which is 40 mg/m<sup>3</sup>.



The calibration curve for glycols is shown below:



**Figure 1.** Calibration curve for Chauvet Geyser with Quick Blast fluid, based on glycol laboratory data. Calibration factor, based on slope of curve, is 1.62 (mg/m<sup>3</sup> glycol) / (mg/m<sup>3</sup> aerosol).

Summary of Calibration Factor				
Manufacturer	Machine	Fluid	Fluid Type	Calibration Factor
Chauvet	Geysers	Quick Blast	Glycol	1.62

**Time and Distance Guidelines.** For various distances from the cue release point, the following table provides the average time (in seconds) after the end of the cue release after which the glycol concentrations will have fallen below the guidance levels. Thus, in order to prevent peak exposures to actors, the blocking and choreography should be arranged such that actors are not situated within a particular distance from the front of the fog release point until the amount of time listed in this table has elapsed following the end of the cue. For example, if a production is using the Chauvet Geysers/Quick Blast combination at full output with 5-second cue duration, an actor should not be situated within five to 20 feet from the front of the cue release point until at least 20 seconds following the end of the cue release. Time-and-Distance testing for the Chauvet Geysers was conducted with the machine positioned to shoot fog horizontally rather than vertically.

Summary of Time-and-Distance Guidelines for Fog Generation Chauvet Geysers with Quick Blast Fluid						
Release Duration (secs)	Time (in sec) After Which Air Concentrations Are Below Guidance Level (40 mg/m <sup>3</sup> )					
	Machine Setting	5 ft	10 ft	15 ft	20 ft	25 ft
5	Full	20	20	20	20	0
15*	Full	20	20	20	20	20
30†	Full	20	20	20	20	20
60‡	Full	20	20	20	20	20

\*Machine turned off after 10 seconds

†Machine pulsed on and off, ran for 15 seconds total

‡Machine pulsed on and off, ran for 25 seconds total

It should be reiterated that the Time-and-Distance Guidelines provided above are intended to allow a production to use the tested equipment and fluid combinations without conducting monitoring. However, these Guidelines may not be appropriate for all productions. Productions may want to use different configurations for positioning the machine (e.g., different heights), provide on-stage ventilation, or generate fog for a shorter or longer period of time. In addition, many productions may have other stage-specific conditions (e.g., on-stage activities and props that enhance dispersion) that would allow actors to be present in areas that are restricted under these Guidelines but which, in fact, do not exceed the guidance levels. In those cases, production-specific monitoring would be recommended to evaluate whether peak exposure may occur.





# Calibration Factor and Time-and-Distance Guidelines

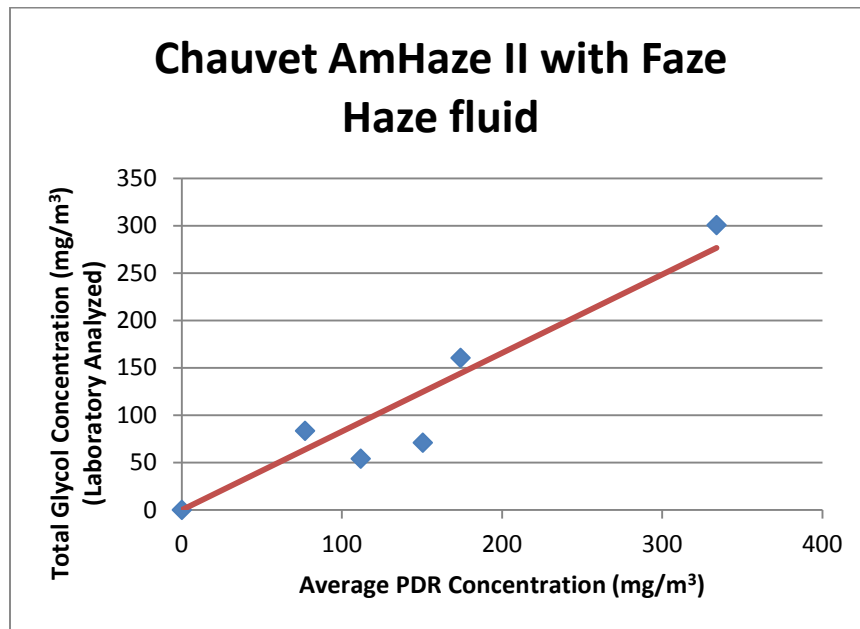
## Chauvet AmHaze II with Faze Haze Fluid

Prepared for Froggy's Fog by ENVIRON International Corporation

ENVIRON developed calibration factors and Time-and-Distance guidelines for the use of Froggy's Fog Faze Haze fluid in a Chauvet AmHaze II haze generator.

Faze Haze is a glycol-based fog fluid. Calibration factors were developed to allow a Thermo Scientific PDR-1000 aerosol monitor to be used to measure concentrations glycols in the air after being released from the AmHaze II.

The measured concentrations should be compared against the peak exposure guidance level for glycols, which is 40 mg/m<sup>3</sup>. The calibration curve for glycols is shown below:



**Figure 1.** Calibration curve for Chauvet AmHaze II with Faze Haze fluid, based on glycol laboratory data. Calibration factor, based on slope of curve, is 0.83 (mg/m<sup>3</sup> glycol) / (mg/m<sup>3</sup> aerosol).

Summary of Calibration Factor				
Manufacturer	Machine	Fluid	Fluid Type	Calibration Factor
Chauvet	AmHaze II	Faze Haze	Glycol	0.83

**Time and Distance Guidelines.** For various distances from the cue release point, the following table provides the average time (in seconds) after the end of the cue release after which the glycol concentrations will have fallen below the guidance levels. Thus, in order to prevent peak exposures to actors, the blocking and choreography should be arranged such that actors are not situated within a particular distance from the front of the fog release point until the amount of time listed in this table has elapsed following the end of the cue. For example, if a production is using the Chauvet AmHaze II/Faze Haze combination operating at an output setting of 65% and a fan setting of 100 with 60-second cue duration, an actor should not be situated within four feet from the front of the cue release point until at least 20 seconds following the end of the cue release.

Summary of Time-and-Distance Guidelines for Fog Generation						
Chauvet AmHaze II with Faze Haze fluid						
Release Duration (secs)	Fan Speed	Output Setting	Time (in sec) After Which Air Concentrations Are Below Guidance Level (40 mg/m <sup>3</sup> )			
			4 ft	8 ft	12 ft	16 ft
30	100	100%	20	0	0	0
60	100	100%	20	0	0	0
120	100	100%	20	30	0	0
30	100	65%	20	0	0	0
60	100	65%	20	0	0	0
120	100	65%	20	0	0	0
30	100	25%	0	0	0	0
60	100	25%	10	0	0	0
120	100	25%	10	0	0	0
30	50	100%	30	30	0	0
60	50	100%	40	40	0	0
120	50	100%	40	40	30	0
30	50	65%	30	30	0	0
60	50	65%	30	30	0	0
120	50	65%	30	30	0	0
30	1	100%	50	50	40	0
60	1	100%	50	50	40	0
120	1	100%	50	50	40	0
30	1	65%	50	50	40	0
60	1	65%	50	50	40	0
120	1	65%	50	50	40	0

It should be reiterated that the Time-and-Distance Guidelines provided above are intended to allow a production to use the tested equipment and fluid combinations without conducting monitoring. However, these Guidelines may not be appropriate for all productions. Productions may want to use different configurations for positioning the machine (e.g., different heights), provide on-stage ventilation, or generate fog for a shorter or longer period of time. In addition, many productions may have other stage-specific conditions (e.g., on-stage activities and props that enhance dispersion) that would allow actors to be present in areas that are restricted under these Guidelines but which, in fact, do not exceed the guidance levels. In those cases, production-specific monitoring would be recommended to evaluate whether peak exposure may occur.



## Calibration Factor and Time-and-Distance Guidelines

### FireBase SG-M1500 with Training Smoke FR Fluid – Fire Rescue Formula

Prepared for Froggy's Fog by ENVIRON International Corporation

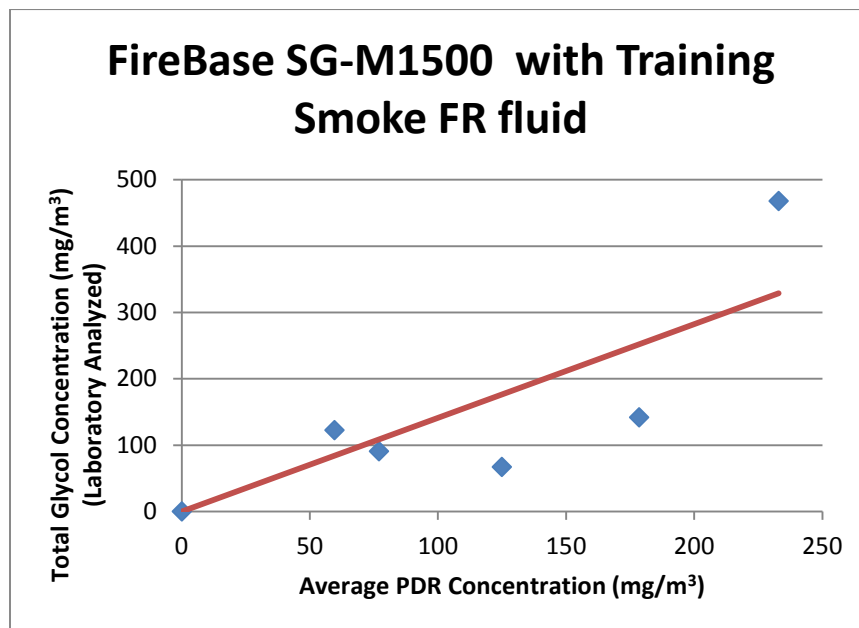
ENVIRON developed calibration factors and Time-and-Distance guidelines for the use of Froggy's Fog Training Smoke FR fluid – Fire Rescue Formula in a FireBase SG-M1500 smoke generator.

Training Smoke FR is a glycol-based smoke fluid. Calibration factors were developed to allow a Thermo Scientific PDR-1000 aerosol monitor to be used to measure concentrations glycols in the air after being released from the SG-M1500.

The measured concentrations should be compared against the peak exposure guidance level for glycols, which is 40 mg/m<sup>3</sup>.



The calibration curve for glycols is shown below:



**Figure 1.** Calibration curve for FireBase SG-M1500 with Training Smoke FR fluid, based on glycol laboratory data. Calibration factor, based on slope of curve, is 1.41 (mg/m<sup>3</sup> glycol) / (mg/m<sup>3</sup> aerosol).

Summary of Calibration Factor				
Manufacturer	Machine	Fluid	Fluid Type	Calibration Factor
FireBase	SG-M1500	Training Smoke FR	Glycol	1.41

**Time and Distance Guidelines.** For various distances from the cue release point, the following table provides the average time (in seconds) after the end of the cue release after which the glycol concentrations will have fallen below the guidance levels. Thus, in order to prevent peak exposures to actors, the blocking and choreography should be arranged such that actors are not situated within a particular distance from the front of the fog release point until the amount of time listed in this table has elapsed following the end of the cue. For example, if a production is using the FireBase SG-M1500/Training Smoke FR combination at 100% output with 15-second cue duration, an actor should not be situated within five to 25 feet from the front of the cue release point until at least 90 seconds following the end of the cue release.

Summary of Time-and-Distance Guidelines for Fog Generation FireBase SG-M1500 with Training Smoke FR Fluid						
Release Duration (secs)	Time (in sec) After Which Air Concentrations Are Below Guidance Level (40 mg/m <sup>3</sup> )					
	Machine Setting	5 ft	10 ft	15 ft	20 ft	25 ft
5	100%	90	90	90	90	90
15	100%	90	90	90	90	90
30*	100%	90	90	90	90	90
30†	65%	60	60	60	50	0
60†	65%	70	70	60	50	10
60	25%	50	0	0	0	0

\*Machine shuts off after 20 seconds

†Machine runs at reduced output volume after 15 seconds

It should be reiterated that the Time-and-Distance Guidelines provided above are intended to allow a production to use the tested equipment and fluid combinations without conducting monitoring. However, these Guidelines may not be appropriate for all productions. Productions may want to use different configurations for positioning the machine (e.g., different heights), provide on-stage ventilation, or generate fog for a shorter or longer period of time. In addition, many productions may have other stage-specific conditions (e.g., on-stage activities and props that enhance dispersion) that would allow actors to be present in areas that are restricted under these Guidelines but which, in fact, do not exceed the guidance levels. In those cases, production-specific monitoring would be recommended to evaluate whether peak exposure may occur.



## Calibration Factor and Time-and-Distance Guidelines

### FireBase SG-M1500 with Training Smoke XD Fluid – Extreme Density

Prepared for Froggy's Fog by ENVIRON International Corporation

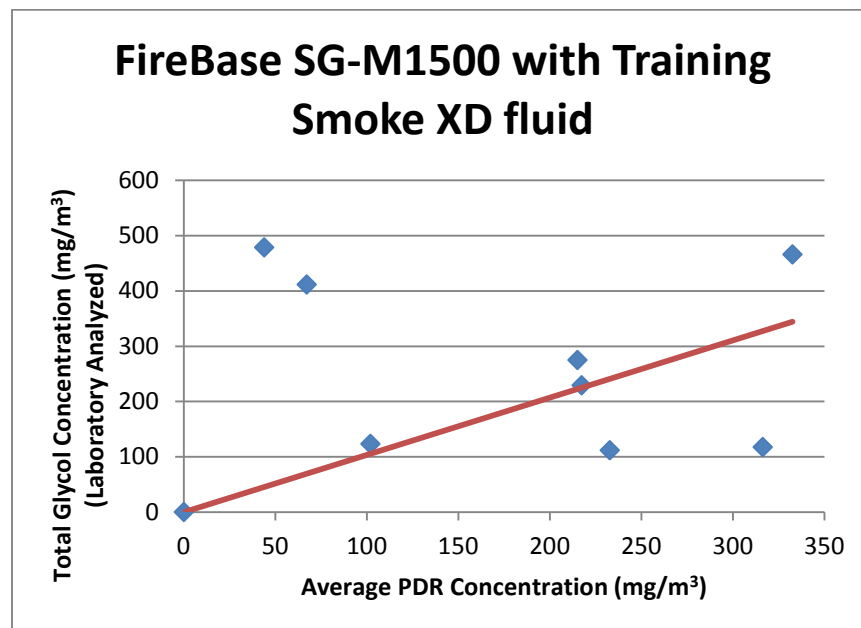
ENVIRON developed calibration factors and Time-and-Distance guidelines for the use of Froggy's Fog Training Smoke XD fluid in a FireBase SG-M1500 smoke generator.

Training Smoke XD is a glycol-based smoke fluid. Calibration factors were developed to allow a Thermo Scientific PDR-1000 aerosol monitor to be used to measure concentrations glycols in the air after being released from the FireBase SG-M1500.

The measured concentrations should be compared against the peak exposure guidance level for glycols, which is 40 mg/m<sup>3</sup>.



The calibration curve for glycols is shown below:



**Figure 1.** Calibration curve for FireBase SG-M1500 with Training Smoke XD fluid, based on glycol laboratory data. Calibration factor, based on slope of curve, is 1.03 (mg/m<sup>3</sup> glycol) / (mg/m<sup>3</sup> aerosol).

Summary of Calibration Factor				
Manufacturer	Machine	Fluid	Fluid Type	Calibration Factor
FireBase	SG-M1500	Training Smoke XD	Glycol	1.03

**Time and Distance Guidelines.** For various distances from the cue release point, the following table provides the average time (in seconds) after the end of the cue release after which the glycol concentrations will have fallen below the guidance levels. Thus, in order to prevent peak exposures to actors, the blocking and choreography should be arranged such that actors are not situated within a particular distance from the front of the fog release point until the amount of time listed in this table has elapsed following the end of the cue. For example, if a production is using the FireBase SG-M1500/Training Smoke XD combination at 100% output with 15-second cue duration, an actor should not be situated within five to 10 feet from the front of the cue release point until at least 90 seconds following the end of the cue release.

Summary of Time-and-Distance Guidelines for Fog Generation FireBase SG-M1500 with Training Smoke XD Fluid						
Release Duration (secs)	Time (in sec) After Which Air Concentrations Are Below Guidance Level (40 mg/m <sup>3</sup> )					
	Machine Setting	5 ft	10 ft	15 ft	20 ft	25 ft
5	100%	90	90	50	30	0
15	100%	90	90	60	60	60
30	100%	100	100	60	60	60
30	65%	100	30	0	0	0
60	65%	110	40	0	0	0
60	25%	110	0	0	0	0

It should be reiterated that the Time-and-Distance Guidelines provided above are intended to allow a production to use the tested equipment and fluid combinations without conducting monitoring. However, these Guidelines may not be appropriate for all productions. Productions may want to use different configurations for positioning the machine (e.g., different heights), provide on-stage ventilation, or generate fog for a shorter or longer period of time. In addition, many productions may have other stage-specific conditions (e.g., on-stage activities and props that enhance dispersion) that would allow actors to be present in areas that are restricted under these Guidelines but which, in fact, do not exceed the guidance levels. In those cases, production-specific monitoring would be recommended to evaluate whether peak exposure may occur.



## Calibration Factor and Time-and-Distance Guidelines

### FireBase SG-M1500 with Training Smoke Q Fluid – Quick Dissipating

Prepared for Froggy's Fog by ENVIRON International Corporation

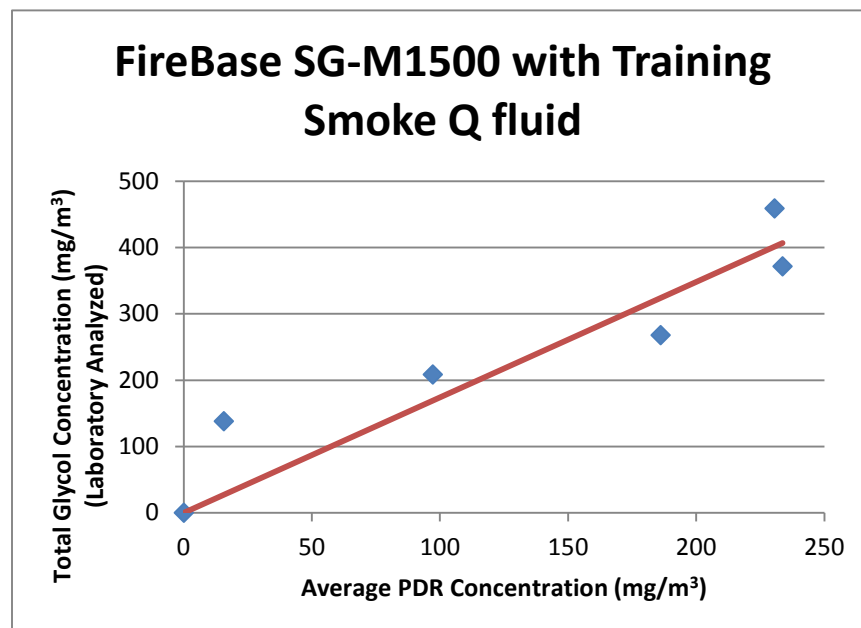
ENVIRON developed calibration factors and Time-and-Distance guidelines for the use of Froggy's Fog Training Smoke Q fluid in a FireBase SG-M1500 smoke generator.

Training Smoke Q is a glycol-based smoke fluid. Calibration factors were developed to allow a Thermo Scientific PDR-1000 aerosol monitor to be used to measure concentrations glycols in the air after being released from the SG-M1500.

The measured concentrations should be compared against the peak exposure guidance level for glycols, which is  $40 \text{ mg/m}^3$ .



The calibration curve for glycols is shown below:



**Figure 1.** Calibration curve for FireBase SG-M1500 with Training Smoke Q fluid, based on glycol laboratory data. Calibration factor, based on slope of curve, is  $1.74 \text{ (mg/m}^3 \text{ glycol) / (mg/m}^3 \text{ aerosol)}$ .

Summary of Calibration Factor				
Manufacturer	Machine	Fluid	Fluid Type	Calibration Factor
FireBase	SG-M1500	Training Smoke Q	Glycol	1.74

**Time and Distance Guidelines.** For various distances from the cue release point, the following table provides the average time (in seconds) after the end of the cue release after which the glycol concentrations will have fallen below the guidance levels. Thus, in order to prevent peak exposures to actors, the blocking and choreography should be arranged such that actors are not situated within a particular distance from the front of the smoke release point until the amount of time listed in this table has elapsed following the end of the cue. For example, if a production is using the FireBase SG-M1500/Training Smoke Q combination at 100% output with 15-second cue duration, an actor should not be situated within five to 15 feet from the front of the cue release point until at least 20 seconds following the end of the cue release.

Summary of Time-and-Distance Guidelines for Smoke Generation FireBase SG-M1500 with Training Smoke Q Fluid						
Release Duration (secs)	Output Setting	Time (in sec) After Which Air Concentrations Are Below Guidance Level (40 mg/m <sup>3</sup> )				
		5 ft	10 ft	15 ft	20 ft	25 ft
5	100%	20	20	0	0	0
15	100%	20	20	20	10	0
30*	100%	20	20	20	10	0
15	65%	10	10	0	0	0
30	65%	10	10	0	0	0
60	65%	20	20	0	0	0
60	25%	20	0	0	0	0

\*Machine shuts off after 20 seconds

It should be reiterated that the Time-and-Distance Guidelines provided above are intended to allow a production to use the tested equipment and fluid combinations without conducting monitoring. However, these Guidelines may not be appropriate for all productions. Productions may want to use different configurations for positioning the machine (e.g., different heights), provide on-stage ventilation, or generate smoke for a shorter or longer period of time. In addition, many productions may have other stage-specific conditions (e.g., on-stage activities and props that enhance dispersion) that would allow actors to be present in areas that are restricted under these Guidelines but which, in fact, do not exceed the guidance levels. In those cases, production-specific monitoring would be recommended to evaluate whether peak exposure may occur.





## Calibration Factor and Time-and-Distance Guidelines

### FireBase SG-M1800 with Training Smoke FR Fluid – Fire Rescue Formula

Prepared for Froggy's Fog by ENVIRON International Corporation

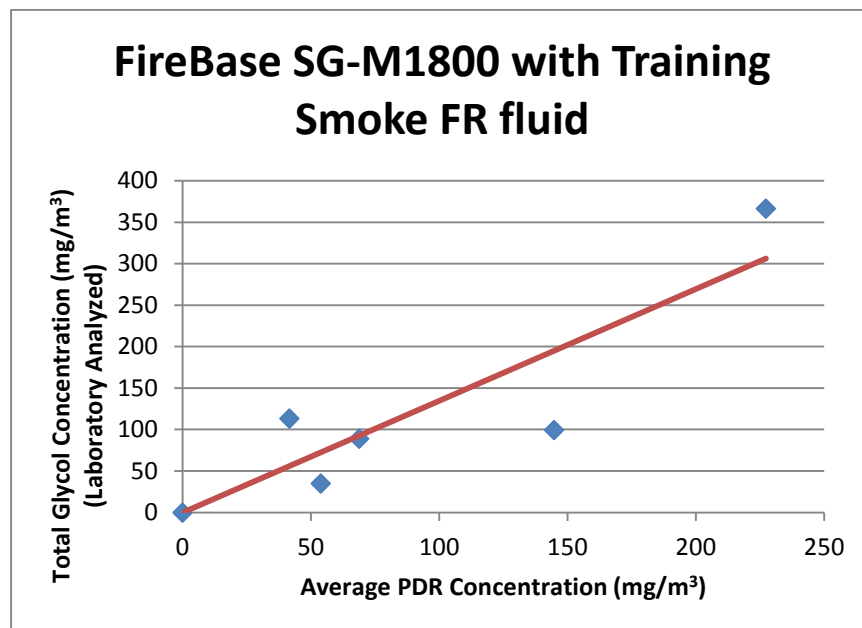
ENVIRON developed calibration factors and Time-and-Distance guidelines for the use of Froggy's Fog Training Smoke FR fluid in a FireBase SG-M1800 smoke generator.

Training Smoke FR is a glycol-based smoke fluid. Calibration factors were developed to allow a Thermo Scientific PDR-1000 aerosol monitor to be used to measure concentrations glycols in the air after being released from the SG-M1800.

The measured concentrations should be compared against the peak exposure guidance level for glycols, which is 40 mg/m<sup>3</sup>.



The calibration curve for glycols is shown below:



**Figure 1.** Calibration curve for FireBase SG-M1800 with Training Smoke FR fluid, based on glycol laboratory data. Calibration factor, based on slope of curve, is 1.35 (mg/m<sup>3</sup> glycol) / (mg/m<sup>3</sup> aerosol).

Summary of Calibration Factor				
Manufacturer	Machine	Fluid	Fluid Type	Calibration Factor
FireBase	SG-M1800	Training Smoke FR	Glycol	1.35

**Time and Distance Guidelines.** For various distances from the cue release point, the following table provides the average time (in seconds) after the end of the cue release after which the glycol concentrations will have fallen below the guidance levels. Thus, in order to prevent peak exposures to actors, the blocking and choreography should be arranged such that actors are not situated within a particular distance from the front of the smoke release point until the amount of time listed in this table has elapsed following the end of the cue. For example, if a production is using the FireBase SG-M1800/Training Smoke FR combination at high output with 15-second cue duration, an actor should not be situated within five to 20 feet from the front of the cue release point until at least 80 seconds following the end of the cue release.

Summary of Time-and-Distance Guidelines for Smoke Generation FireBase SG-M1800 with Training Smoke FR Fluid						
Release Duration (secs)	Time (in sec) After Which Air Concentrations Are Below Guidance Level (40 mg/m <sup>3</sup> )					
	Machine Setting	5 ft	10 ft	15 ft	20 ft	25 ft
5	High	80	80	80	80	70
15	High	80	80	80	80	70
30	High	80	80	80	80	70
30	Medium	50	50	50	50	40
60	Medium	60	60	60	60	50
120*	Medium	70	70	60	60	50
60	Low†	60	60	60	60	50
120	Low†	70	70	60	60	50

\*Machine shuts off after 52 seconds

†Machine pulses every 5 seconds at low setting

It should be reiterated that the Time-and-Distance Guidelines provided above are intended to allow a production to use the tested equipment and fluid combinations without conducting monitoring. However, these Guidelines may not be appropriate for all productions. Productions may want to use different configurations for positioning the machine (e.g., different heights), provide on-stage ventilation, or generate smoke for a shorter or longer period of time. In addition, many productions may have other stage-specific conditions (e.g., on-stage activities and props that enhance dispersion) that would allow actors to be present in areas that are restricted under these Guidelines but which, in fact, do not exceed the guidance levels. In those cases, production-specific monitoring would be recommended to evaluate whether peak exposure may occur.



## Calibration Factor and Time-and-Distance Guidelines

### FireBase SG-M1800 with Training Smoke XD Fluid – Extreme Density

Prepared for Froggy's Fog by ENVIRON International Corporation

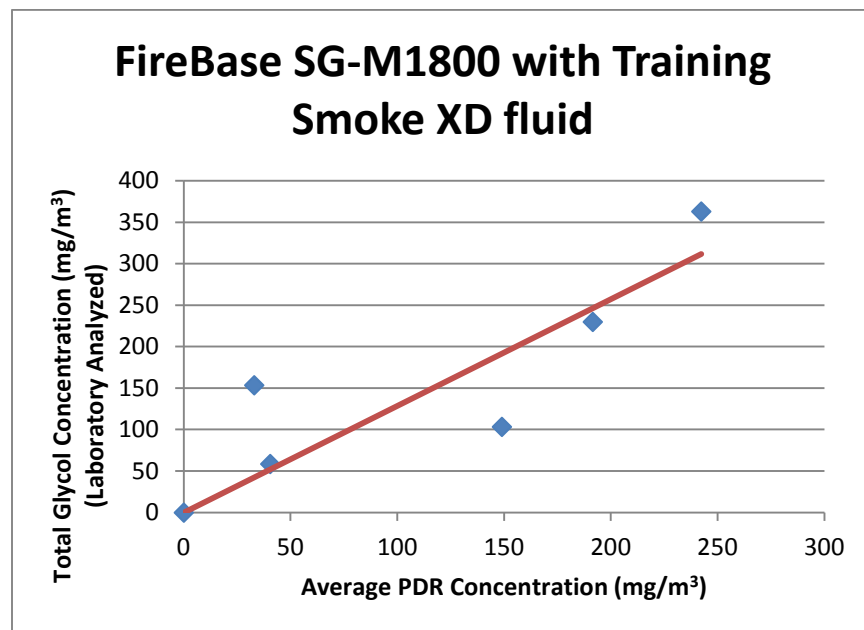
ENVIRON developed calibration factors and Time-and-Distance guidelines for the use of Froggy's Fog Training Smoke XD fluid in a FireBase SG-M1800 smoke generator.

Training Smoke XD is a glycol-based smoke fluid. Calibration factors were developed to allow a Thermo Scientific PDR-1000 aerosol monitor to be used to measure concentrations glycols in the air after being released from the SG-M1800.

The measured concentrations should be compared against the peak exposure guidance level for glycols, which is 40 mg/m<sup>3</sup>.



The calibration curve for glycols is shown below:



**Figure 1.** Calibration curve for FireBase SG-M1800 with Training Smoke XD fluid, based on glycol laboratory data. Calibration factor, based on slope of curve, is 1.29 (mg/m<sup>3</sup> glycol) / (mg/m<sup>3</sup> aerosol).

Summary of Calibration Factor				
Manufacturer	Machine	Fluid	Fluid Type	Calibration Factor
FireBase	SG-M1800	Training Smoke XD	Glycol	1.29

**Time and Distance Guidelines.** For various distances from the cue release point, the following table provides the average time (in seconds) after the end of the cue release after which the glycol concentrations will have fallen below the guidance levels. Thus, in order to prevent peak exposures to actors, the blocking and choreography should be arranged such that actors are not situated within a particular distance from the front of the smoke release point until the amount of time listed in this table has elapsed following the end of the cue. For example, if a production is using the FireBase SG-M1800/Training Smoke XD combination at high output with 15-second cue duration, an actor should not be situated within five to 10 feet from the front of the cue release point until at least 70 seconds following the end of the cue release.

Summary of Time-and-Distance Guidelines for Smoke Generation FireBase SG-M1800 with Training Smoke XD Fluid						
Release Duration (secs)	Time (in sec) After Which Air Concentrations Are Below Guidance Level (40 mg/m <sup>3</sup> )					
	Machine Setting	5 ft	10 ft	15 ft	20 ft	25 ft
5	High	40	40	30	20	0
15	High	70	70	60	60	60
30	High	70	70	60	60	60
15	Med	60	60	60	60	60
30	Med	60	60	60	60	60
60*	Med	110	110	60	60	60
60	Low	110	110	10	0	0
120†	Low	110	110	10	0	0

\*Machine shuts off after 40 seconds

†Machine shuts off after 90 seconds

It should be reiterated that the Time-and-Distance Guidelines provided above are intended to allow a production to use the tested equipment and fluid combinations without conducting monitoring. However, these Guidelines may not be appropriate for all productions. Productions may want to use different configurations for positioning the machine (e.g., different heights), provide on-stage ventilation, or generate smoke for a shorter or longer period of time. In addition, many productions may have other stage-specific conditions (e.g., on-stage activities and props that enhance dispersion) that would allow actors to be present in areas that are restricted under these Guidelines but which, in fact, do not exceed the guidance levels. In those cases, production-specific monitoring would be recommended to evaluate whether peak exposure may occur.



## Calibration Factor and Time-and-Distance Guidelines

### FireBase SG-M1800 with Training Smoke Q Fluid – Quick Dissipating

Prepared for Froggy's Fog by ENVIRON International Corporation

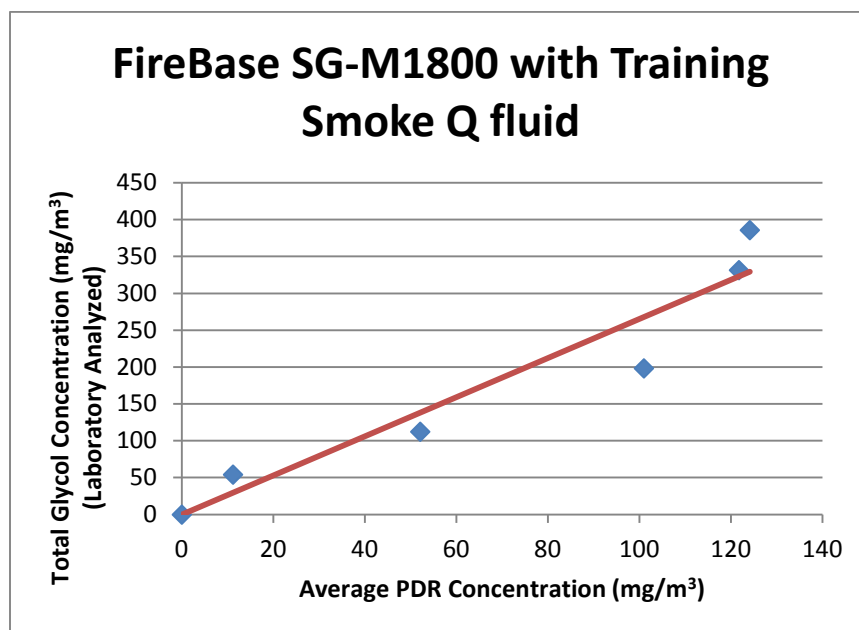
ENVIRON developed calibration factors and Time-and-Distance guidelines for the use of Froggy's Fog Training Smoke Q fluid in a FireBase SG-M1800 smoke generator.

Training Smoke Q is a glycol-based smoke fluid. Calibration factors were developed to allow a Thermo Scientific PDR-1000 aerosol monitor to be used to measure concentrations glycols in the air after being released from the SG-M1800.

The measured concentrations should be compared against the peak exposure guidance level for glycols, which is 40 mg/m<sup>3</sup>.



The calibration curve for glycols is shown below:



**Figure 1.** Calibration curve for FireBase SG-M1800 with Training Smoke Q fluid, based on glycol laboratory data. Calibration factor, based on slope of curve, is 2.65 (mg/m<sup>3</sup> glycol) / (mg/m<sup>3</sup> aerosol).

Summary of Calibration Factor				
Manufacturer	Machine	Fluid	Fluid Type	Calibration Factor
FireBase	SG-M1800	Training Smoke Q	Glycol	2.65

**Time and Distance Guidelines.** For various distances from the cue release point, the following table provides the average time (in seconds) after the end of the cue release after which the glycol concentrations will have fallen below the guidance levels. Thus, in order to prevent peak exposures to actors, the blocking and choreography should be arranged such that actors are not situated within a particular distance from the front of the smoke release point until the amount of time listed in this table has elapsed following the end of the cue. For example, if a production is using the FireBase SG-M1800/Training Smoke Q combination at high output with 15-second cue duration, an actor should not be situated within five to 10 feet from the front of the cue release point until at least 40 seconds following the end of the cue release.

Summary of Time-and-Distance Guidelines for Smoke Generation FireBase SG-M1800 with Training Smoke Q Fluid						
Release Duration (secs)	Time (in sec) After Which Air Concentrations Are Below Guidance Level (40 mg/m <sup>3</sup> )					
	Machine Setting	5 ft	10 ft	15 ft	20 ft	25 ft
5	High	30	30	30	30	0
15	High	40	40	30	30	30
30*	High	40	40	30	30	30
15	Med	30	30	30	30	0
30†	Med	30	30	30	30	10
60‡	Med	30	30	30	30	10
60	Low	30	30	0	0	0
120	Low	30	30	0	0	0

\*Machine runs at reduced output volume after 10 seconds

†Machine runs at reduced output volume after 20 seconds

‡Machine shuts off after 49 seconds

It should be reiterated that the Time-and-Distance Guidelines provided above are intended to allow a production to use the tested equipment and fluid combinations without conducting monitoring. However, these Guidelines may not be appropriate for all productions. Productions may want to use different configurations for positioning the machine (e.g., different heights), provide on-stage ventilation, or generate smoke for a shorter or longer period of time. In addition, many productions may have other stage-specific conditions (e.g., on-stage activities and props that enhance dispersion) that would allow actors to be present in areas that are restricted under these Guidelines but which, in fact, do not exceed the guidance levels. In those cases, production-specific monitoring would be recommended to evaluate whether peak exposure may occur.



## Calibration Factor and Time-and-Distance Guidelines

### FireBase SG-M3000 with Training Smoke XD Fluid – Extreme Density

Prepared for Froggy's Fog by ENVIRON International Corporation

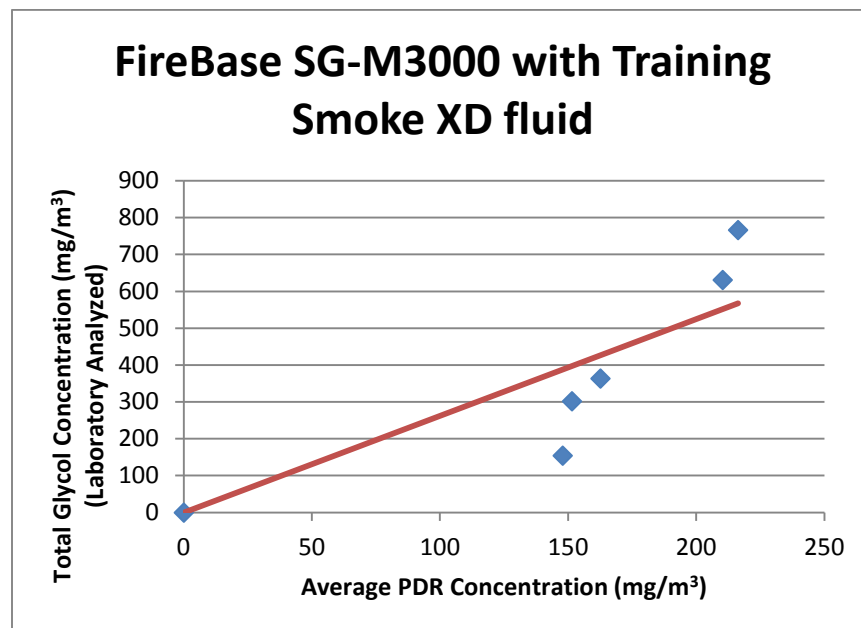
ENVIRON developed calibration factors and Time-and-Distance guidelines for the use of Froggy's Fog Training Smoke XD fluid in a FireBase SG-M3000 smoke generator.

Training Smoke XD is a glycol-based smoke fluid. Calibration factors were developed to allow a Thermo Scientific PDR-1000 aerosol monitor to be used to measure concentrations glycols in the air after being released from the SG-M3000.

The measured concentrations should be compared against the peak exposure guidance level for glycols, which is 40 mg/m<sup>3</sup>.



The calibration curve for glycols is shown below:



**Figure 1.** Calibration curve for FireBase SG-M3000 with Training Smoke XD fluid, based on glycol laboratory data. Calibration factor, based on slope of curve, is 2.62 (mg/m<sup>3</sup> glycol) / (mg/m<sup>3</sup> aerosol).

Summary of Calibration Factor				
Manufacturer	Machine	Fluid	Fluid Type	Calibration Factor
FireBase	SG-M3000	Training Smoke XD	Glycol	2.62

**Time and Distance Guidelines.** For various distances from the cue release point, the following table provides the average time (in seconds) after the end of the cue release after which the glycol concentrations will have fallen below the guidance levels. Thus, in order to prevent peak exposures to actors, the blocking and choreography should be arranged such that actors are not situated within a particular distance from the front of the smoke release point until the amount of time listed in this table has elapsed following the end of the cue. For example, if a production is using the FireBase SG-M3000/Training Smoke XD combination at 100% output with 15-second cue duration, an actor should not be situated within five to 10 feet from the front of the cue release point until at least 100 seconds following the end of the cue release.

Summary of Time-and-Distance Guidelines for Smoke Generation FireBase SG-M3000 with Training Smoke XD Fluid						
Release Duration (secs)	Time (in sec) After Which Air Concentrations Are Below Guidance Level (40 mg/m <sup>3</sup> )					
	Machine Setting	5 ft	10 ft	15 ft	20 ft	25 ft
5	100%	90	90	90	70	70
15	100%	100	100	90	70	70
30	100%	120	120	100	100	70
15	65%	90	60	50	40	30
30	65%	120	120	70	70	60
60*	65%	120	120	70	70	60
60	25%	60	0	0	0	0
120	25%	60	30	0	0	0

\*Machine shuts off after 48 seconds

It should be reiterated that the Time-and-Distance Guidelines provided above are intended to allow a production to use the tested equipment and fluid combinations without conducting monitoring. However, these Guidelines may not be appropriate for all productions. Productions may want to use different configurations for positioning the machine (e.g., different heights), provide on-stage ventilation, or generate smoke for a shorter or longer period of time. In addition, many productions may have other stage-specific conditions (e.g., on-stage activities and props that enhance dispersion) that would allow actors to be present in areas that are restricted under these Guidelines but which, in fact, do not exceed the guidance levels. In those cases, production-specific monitoring would be recommended to evaluate whether peak exposure may occur.





# Calibration Factor and Time-and-Distance Guidelines

## FireBase SG-M3000 with Training Smoke Q Fluid – Quick Dissipating

Prepared for Froggy's Fog by ENVIRON International Corporation

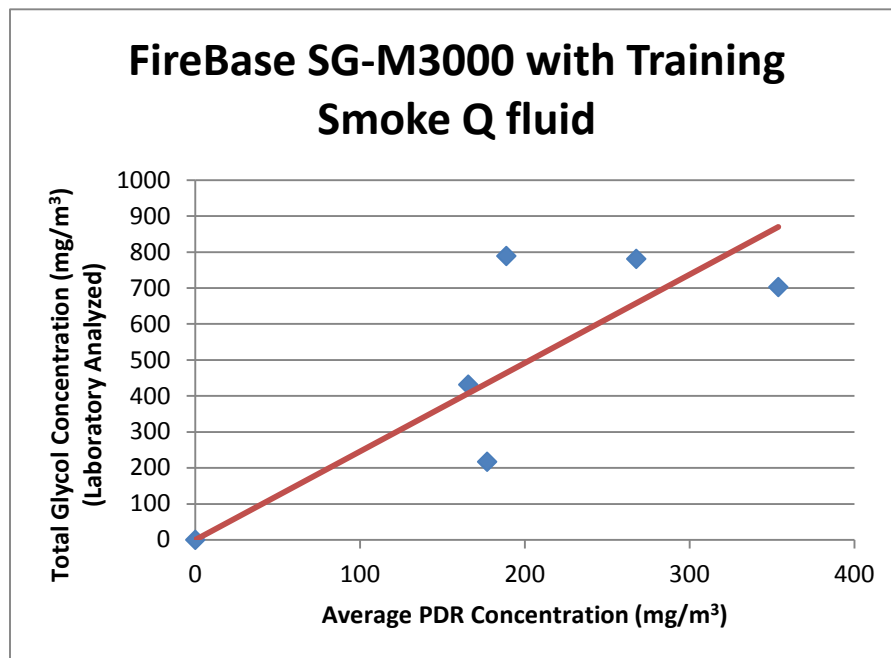
ENVIRON developed calibration factors and Time-and-Distance guidelines for the use of Froggy's Fog Training Smoke Q fluid in a FireBase SG-M3000 smoke generator.

Training Smoke Q is a glycol-based smoke fluid. Calibration factors were developed to allow a Thermo Scientific PDR-1000 aerosol monitor to be used to measure concentrations glycols in the air after being released from the SG-M3000.

The measured concentrations should be compared against the peak exposure guidance level for glycols, which is 40 mg/m<sup>3</sup>.



The calibration curve for glycols is shown below:



**Figure 1.** Calibration curve for FireBase SG-M3000 with Training Smoke Q fluid, based on glycol laboratory data. Calibration factor, based on slope of curve, is 2.46 (mg/m<sup>3</sup> glycol) / (mg/m<sup>3</sup> aerosol).

Summary of Calibration Factor				
Manufacturer	Machine	Fluid	Fluid Type	Calibration Factor
FireBase	SG-M3000	Training Smoke Q	Glycol	2.46

**Time and Distance Guidelines.** For various distances from the cue release point, the following table provides the average time (in seconds) after the end of the cue release after which the glycol concentrations will have fallen below the guidance levels. Thus, in order to prevent peak exposures to actors, the blocking and choreography should be arranged such that actors are not situated within a particular distance from the front of the smoke release point until the amount of time listed in this table has elapsed following the end of the cue. For example, if a production is using the FireBase SG-M3000/Training Smoke Q combination at 100% output with 15-second cue duration, an actor should not be situated within five to 20 feet from the front of the cue release point until at least 30 seconds following the end of the cue release.

Summary of Time-and-Distance Guidelines for Smoke Generation FireBase SG-M3000 with Training Smoke Q Fluid						
Release Duration (secs)	Time (in sec) After Which Air Concentrations Are Below Guidance Level (40 mg/m <sup>3</sup> )					
	Machine Setting	5 ft	10 ft	15 ft	20 ft	25 ft
5	100%	30	30	30	30	20
15	100%	30	30	30	30	20
30	100%	30	30	30	30	20
15	65%	30	20	20	0	0
30	65%	30	30	30	0	0
60	65%	30	30	30	0	0
60	25%	0	0	0	0	0
120	25%	0	0	0	0	0

It should be reiterated that the Time-and-Distance Guidelines provided above are intended to allow a production to use the tested equipment and fluid combinations without conducting monitoring. However, these Guidelines may not be appropriate for all productions. Productions may want to use different configurations for positioning the machine (e.g., different heights), provide on-stage ventilation, or generate smoke for a shorter or longer period of time. In addition, many productions may have other stage-specific conditions (e.g., on-stage activities and props that enhance dispersion) that would allow actors to be present in areas that are restricted under these Guidelines but which, in fact, do not exceed the guidance levels. In those cases, production-specific monitoring would be recommended to evaluate whether peak exposure may occur.



## Calibration Factor and Time-and-Distance Guidelines

### FireBase SG-1300 with Training Smoke FR Fluid – Fire Rescue Formula

Prepared for Froggy's Fog by ENVIRON International Corporation

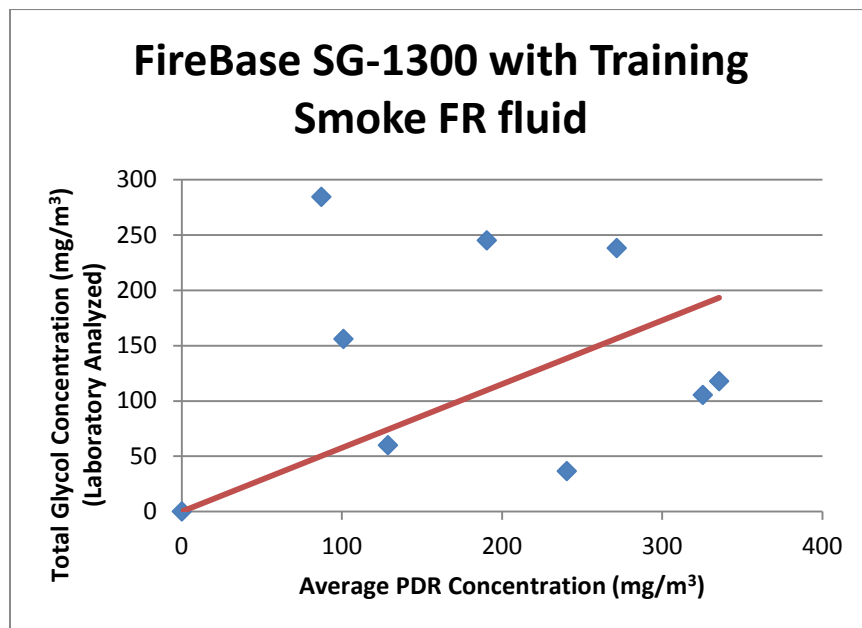
ENVIRON developed calibration factors and Time-and-Distance guidelines for the use of Froggy's Fog Training Smoke FR fluid in a FireBase SG-1300 smoke generator.

Training Smoke FR is a glycol-based smoke fluid. Calibration factors were developed to allow a Thermo Scientific PDR-1000 aerosol monitor to be used to measure concentrations glycols in the air after being released from the SG-1300.

The measured concentrations should be compared against the peak exposure guidance level for glycols, which is 40 mg/m<sup>3</sup>.



The calibration curve for glycols is shown below:



**Figure 1.** Calibration curve for FireBase SG-1300 with Training Smoke FR fluid, based on glycol laboratory data. Calibration factor, based on slope of curve, is 0.58 (mg/m<sup>3</sup> glycol) / (mg/m<sup>3</sup> aerosol).

Summary of Calibration Factor				
Manufacturer	Machine	Fluid	Fluid Type	Calibration Factor
FireBase	SG-1300	Training Smoke FR	Glycol	0.58

**Time and Distance Guidelines.** For various distances from the cue release point, the following table provides the average time (in seconds) after the end of the cue release after which the glycol concentrations will have fallen below the guidance levels. Thus, in order to prevent peak exposures to actors, the blocking and choreography should be arranged such that actors are not situated within a particular distance from the front of the smoke release point until the amount of time listed in this table has elapsed following the end of the cue. For example, if a production is using the FireBase SG-1300/Training Smoke FR combination at 99% output with 15-second cue duration, an actor should not be situated within five to 25 feet from the front of the cue release point until at least 30 seconds following the end of the cue release.

Summary of Time-and-Distance Guidelines for Smoke Generation FireBase SG-1300 with Training Smoke FR Fluid						
Release Duration (secs)	Time (in sec) After Which Air Concentrations Are Below Guidance Level (40 mg/m <sup>3</sup> )					
	Machine Setting	5 ft	10 ft	15 ft	20 ft	25 ft
5	99%	30	30	30	30	30
15	99%	30	30	30	30	30
30*	99%	50	40	30	30	30
30	65%	50	10	0	0	0
60	65%	50	10	0	0	0
120	65%	50	10	0	0	0
60	25%	40	0	0	0	0
120	25%	40	0	0	0	0

\*Machine had reduced output volume after 20 seconds

It should be reiterated that the Time-and-Distance Guidelines provided above are intended to allow a production to use the tested equipment and fluid combinations without conducting monitoring. However, these Guidelines may not be appropriate for all productions. Productions may want to use different configurations for positioning the machine (e.g., different heights), provide on-stage ventilation, or generate smoke for a shorter or longer period of time. In addition, many productions may have other stage-specific conditions (e.g., on-stage activities and props that enhance dispersion) that would allow actors to be present in areas that are restricted under these Guidelines but which, in fact, do not exceed the guidance levels. In those cases, production-specific monitoring would be recommended to evaluate whether peak exposure may occur.



## Calibration Factor and Time-and-Distance Guidelines

### FireBase SG-1300 with Training Smoke XD Fluid – Extreme Density

Prepared for Froggy's Fog by ENVIRON International Corporation

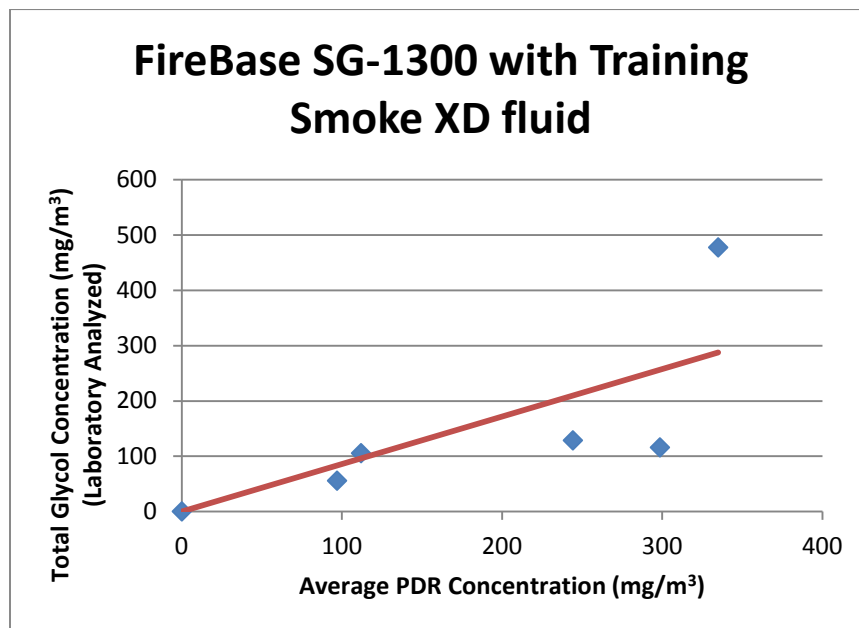
ENVIRON developed calibration factors and Time-and-Distance guidelines for the use of Froggy's Fog Training Smoke XD fluid in a FireBase SG-1300 smoke generator.

Training Smoke XD is a glycol-based smoke fluid. Calibration factors were developed to allow a Thermo Scientific PDR-1000 aerosol monitor to be used to measure concentrations glycols in the air after being released from the SG-1300.

The measured concentrations should be compared against the peak exposure guidance level for glycols, which is 40 mg/m<sup>3</sup>.



The calibration curve for glycols is shown below:



**Figure 1.** Calibration curve for FireBase SG-1300 with Training Smoke XD fluid, based on glycol laboratory data. Calibration factor, based on slope of curve, is 0.86 (mg/m<sup>3</sup> glycol) / (mg/m<sup>3</sup> aerosol).

Summary of Calibration Factor				
Manufacturer	Machine	Fluid	Fluid Type	Calibration Factor
FireBase	SG-1300	Training Smoke XD	Glycol	0.86

**Time and Distance Guidelines.** For various distances from the cue release point, the following table provides the average time (in seconds) after the end of the cue release after which the glycol concentrations will have fallen below the guidance levels. Thus, in order to prevent peak exposures to actors, the blocking and choreography should be arranged such that actors are not situated within a particular distance from the front of the smoke release point until the amount of time listed in this table has elapsed following the end of the cue. For example, if a production is using the FireBase SG-1300/Training Smoke XD combination at 99% output with 15-second cue duration, an actor should not be situated within five to 25 feet from the front of the cue release point until at least 50 seconds following the end of the cue release.

Summary of Time-and-Distance Guidelines for Smoke Generation FireBase SG-1300 with Training Smoke XD Fluid						
Release Duration (secs)	Output Setting	Time (in sec) After Which Air Concentrations Are Below Guidance Level (40 mg/m <sup>3</sup> )				
		5 ft	10 ft	15 ft	20 ft	25 ft
5	99%	40	40	40	30	30
15	99%	50	50	50	50	50
30	99%	70	50	50	50	50
30	65%	70	0	0	0	0
60	65%	70	0	0	0	0
120	65%	70	0	0	0	0
60	25%	0	0	0	0	0
120	25%	0	0	0	0	0

It should be reiterated that the Time-and-Distance Guidelines provided above are intended to allow a production to use the tested equipment and fluid combinations without conducting monitoring. However, these Guidelines may not be appropriate for all productions. Productions may want to use different configurations for positioning the machine (e.g., different heights), provide on-stage ventilation, or generate smoke for a shorter or longer period of time. In addition, many productions may have other stage-specific conditions (e.g., on-stage activities and props that enhance dispersion) that would allow actors to be present in areas that are restricted under these Guidelines but which, in fact, do not exceed the guidance levels. In those cases, production-specific monitoring would be recommended to evaluate whether peak exposure may occur.



## Calibration Factor and Time-and-Distance Guidelines

### FireBase SG-1300 with Training Smoke Q Fluid – Quick Dissipating

Prepared for Froggy's Fog by ENVIRON International Corporation

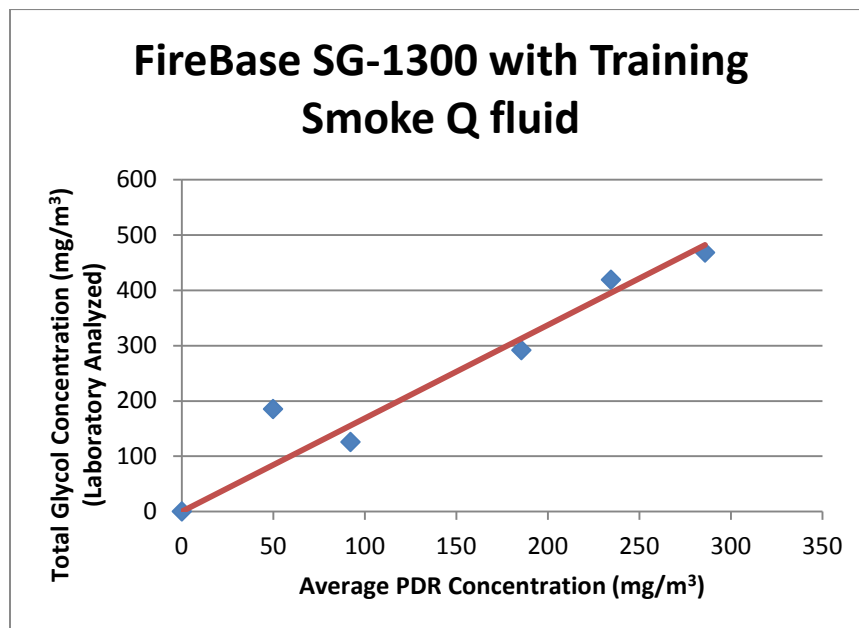
ENVIRON developed calibration factors and Time-and-Distance guidelines for the use of Froggy's Fog Training Smoke Q fluid in a FireBase SG-1300 smoke generator.

Training Smoke Q is a glycol-based smoke fluid. Calibration factors were developed to allow a Thermo Scientific PDR-1000 aerosol monitor to be used to measure concentrations glycols in the air after being released from the SG-1300.

The measured concentrations should be compared against the peak exposure guidance level for glycols, which is 40 mg/m<sup>3</sup>.



The calibration curve for glycols is shown below:



**Figure 1.** Calibration curve for FireBase SG-1300 with Training Smoke Q fluid, based on glycol laboratory data. Calibration factor, based on slope of curve, is 1.69 (mg/m<sup>3</sup> glycol) / (mg/m<sup>3</sup> aerosol).

Summary of Calibration Factor				
Manufacturer	Machine	Fluid	Fluid Type	Calibration Factor
FireBase	SG-1300	Training Smoke Q	Glycol	1.69

**Time and Distance Guidelines.** For various distances from the cue release point, the following table provides the average time (in seconds) after the end of the cue release after which the glycol concentrations will have fallen below the guidance levels. Thus, in order to prevent peak exposures to actors, the blocking and choreography should be arranged such that actors are not situated within a particular distance from the front of the smoke release point until the amount of time listed in this table has elapsed following the end of the cue. For example, if a production is using the FireBase SG-1300/Training Smoke Q combination at 99% output with 15-second cue duration, an actor should not be situated within five to 25 feet from the front of the cue release point until at least 20 seconds following the end of the cue release.

Summary of Time-and-Distance Guidelines for Smoke Generation FireBase SG-1300 with Training Smoke Q Fluid						
Release Duration (secs)	Time (in sec) After Which Air Concentrations Are Below Guidance Level (40 mg/m <sup>3</sup> )					
	Machine Setting	5 ft	10 ft	15 ft	20 ft	25 ft
5	99%	0	0	0	0	0
15	99%	20	20	20	20	20
30	99%	30	20	20	20	20
30	65%	30	0	0	0	0
60	65%	30	10	0	0	0
120	65%	30	10	0	0	0
60	25%	0	0	0	0	0
120	25%	0	0	0	0	0

It should be reiterated that the Time-and-Distance Guidelines provided above are intended to allow a production to use the tested equipment and fluid combinations without conducting monitoring. However, these Guidelines may not be appropriate for all productions. Productions may want to use different configurations for positioning the machine (e.g., different heights), provide on-stage ventilation, or generate smoke for a shorter or longer period of time. In addition, many productions may have other stage-specific conditions (e.g., on-stage activities and props that enhance dispersion) that would allow actors to be present in areas that are restricted under these Guidelines but which, in fact, do not exceed the guidance levels. In those cases, production-specific monitoring would be recommended to evaluate whether peak exposure may occur.





# Calibration Factor and Time-and-Distance Guidelines

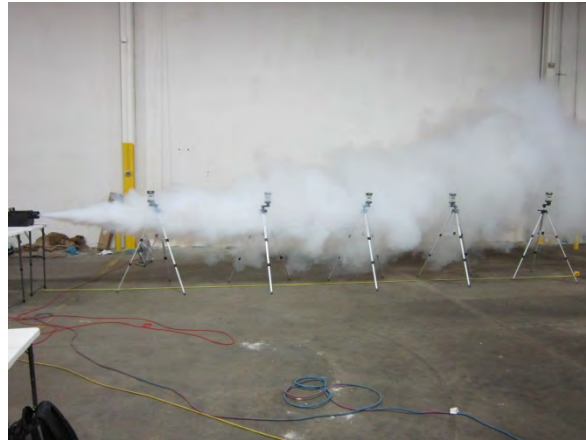
## FireBase SG-2600 with Training Smoke FR Fluid – Fire Rescue Formula

Prepared for Froggy's Fog by ENVIRON International Corporation

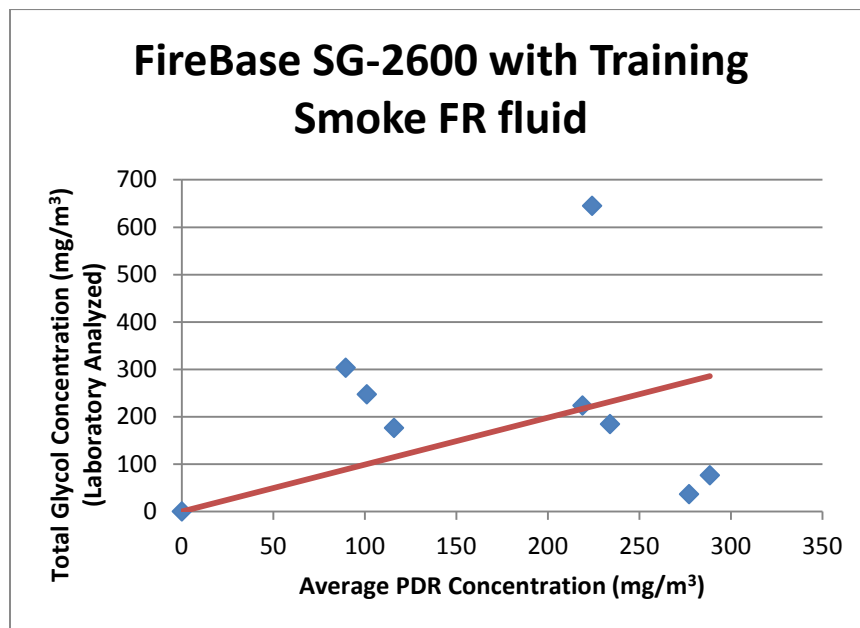
ENVIRON developed calibration factors and Time-and-Distance guidelines for the use of Froggy's Fog Training Smoke FR fluid in a FireBase SG-2600 smoke generator.

Training Smoke FR is a glycol-based smoke fluid. Calibration factors were developed to allow a Thermo Scientific PDR-1000 aerosol monitor to be used to measure concentrations glycols in the air after being released from the SG-2600.

The measured concentrations should be compared against the peak exposure guidance level for glycols, which is 40 mg/m<sup>3</sup>.



The calibration curve for glycols is shown below:



**Figure 1.** Calibration curve for FireBase SG-2600 with Training Smoke FR fluid, based on glycol laboratory data. Calibration factor, based on slope of curve, is 0.99 (mg/m<sup>3</sup> glycol) / (mg/m<sup>3</sup> aerosol).

Summary of Calibration Factor				
Manufacturer	Machine	Fluid	Fluid Type	Calibration Factor
FireBase	SG-2600	Training Smoke FR	Glycol	0.99

**Time and Distance Guidelines.** For various distances from the cue release point, the following table provides the average time (in seconds) after the end of the cue release after which the glycol concentrations will have fallen below the guidance levels. Thus, in order to prevent peak exposures to actors, the blocking and choreography should be arranged such that actors are not situated within a particular distance from the front of the smoke release point until the amount of time listed in this table has elapsed following the end of the cue. For example, if a production is using the FireBase SG-2600/Training Smoke FR combination at 99% output with 15-second cue duration, an actor should not be situated within five to 25 feet from the front of the cue release point until at least 40 seconds following the end of the cue release.

Summary of Time-and-Distance Guidelines for Smoke Generation FireBase SG-2600 with Training Smoke FR Fluid						
Release Duration (secs)	Time (in sec) After Which Air Concentrations Are Below Guidance Level (40 mg/m <sup>3</sup> )					
	Machine Setting	5 ft	10 ft	15 ft	20 ft	25 ft
5	99%	40	40	40	40	40
15	99%	40	40	40	40	40
30*	99%	50	50	40	40	40
30	65%	20	0	0	0	0
60	65%	20	0	0	0	0
120	65%	>180	0	0	0	0
60	25%	0	0	0	0	0
120	25%	0	0	0	0	0

\*Machine had reduced output volume after 20 seconds

It should be reiterated that the Time-and-Distance Guidelines provided above are intended to allow a production to use the tested equipment and fluid combinations without conducting monitoring. However, these Guidelines may not be appropriate for all productions. Productions may want to use different configurations for positioning the machine (e.g., different heights), provide on-stage ventilation, or generate smoke for a shorter or longer period of time. In addition, many productions may have other stage-specific conditions (e.g., on-stage activities and props that enhance dispersion) that would allow actors to be present in areas that are restricted under these Guidelines but which, in fact, do not exceed the guidance levels. In those cases, production-specific monitoring would be recommended to evaluate whether peak exposure may occur.



## Calibration Factor and Time-and-Distance Guidelines

### FireBase SG-2600 with Training Smoke XD Fluid – Extreme Density

Prepared for Froggy's Fog by ENVIRON International Corporation

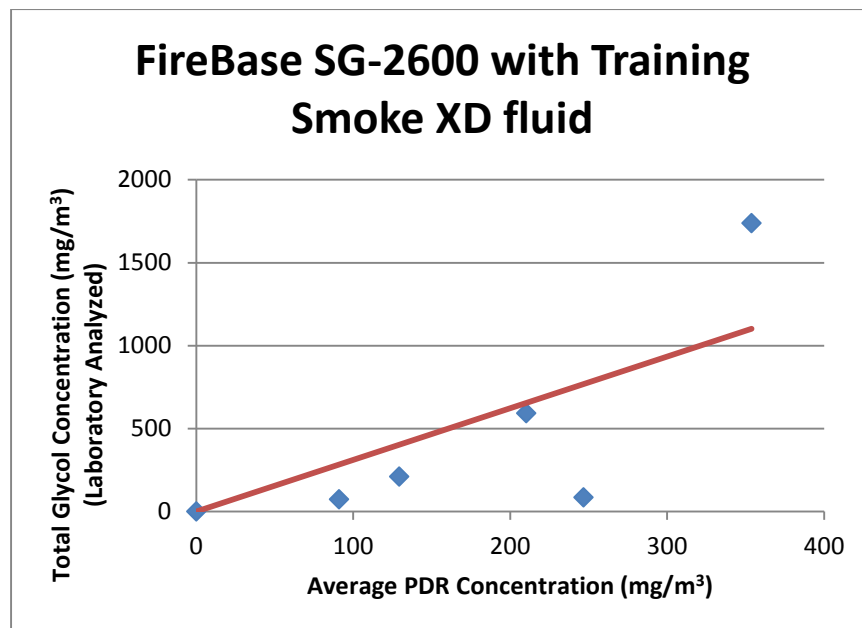
ENVIRON developed calibration factors and Time-and-Distance guidelines for the use of Froggy's Fog Training Smoke XD fluid in a FireBase SG-2600 smoke generator.

Training Smoke XD is a glycol-based smoke fluid. Calibration factors were developed to allow a Thermo Scientific PDR-1000 aerosol monitor to be used to measure concentrations glycols in the air after being released from the SG-2600.

The measured concentrations should be compared against the peak exposure guidance level for glycols, which is 40 mg/m<sup>3</sup>.



The calibration curve for glycols is shown below:



**Figure 1.** Calibration curve for FireBase SG-2600 with Training Smoke XD fluid, based on glycol laboratory data. Calibration factor, based on slope of curve, is 3.11 (mg/m<sup>3</sup> glycol) / (mg/m<sup>3</sup> aerosol).

Summary of Calibration Factor				
Manufacturer	Machine	Fluid	Fluid Type	Calibration Factor
FireBase	SG-2600	Training Smoke XD	Glycol	3.11

**Time and Distance Guidelines.** For various distances from the cue release point, the following table provides the average time (in seconds) after the end of the cue release after which the glycol concentrations will have fallen below the guidance levels. Thus, in order to prevent peak exposures to actors, the blocking and choreography should be arranged such that actors are not situated within a particular distance from the front of the smoke release point until the amount of time listed in this table has elapsed following the end of the cue. For example, if a production is using the FireBase SG-2600/Training Smoke XD combination at 99% output with 15-second cue duration, an actor should not be situated within five feet from the front of the cue release point until at least 90 seconds following the end of the cue release.

Summary of Time-and-Distance Guidelines for Smoke Generation FireBase SG-2600 with Training Smoke XD Fluid						
Release Duration (secs)	Time (in sec) After Which Air Concentrations Are Below Guidance Level (40 mg/m <sup>3</sup> )					
	Machine Setting	5 ft	10 ft	15 ft	20 ft	25 ft
5	99%	90	50	40	40	40
15	99%	90	50	40	40	40
30	99%	90	70	40	40	40
30	65%	60	0	0	0	0
60	65%	60	0	0	0	0
120	65%	60	0	0	0	0
60	25%	0	0	0	0	0
120	25%	0	0	0	0	0

It should be reiterated that the Time-and-Distance Guidelines provided above are intended to allow a production to use the tested equipment and fluid combinations without conducting monitoring. However, these Guidelines may not be appropriate for all productions. Productions may want to use different configurations for positioning the machine (e.g., different heights), provide on-stage ventilation, or generate smoke for a shorter or longer period of time. In addition, many productions may have other stage-specific conditions (e.g., on-stage activities and props that enhance dispersion) that would allow actors to be present in areas that are restricted under these Guidelines but which, in fact, do not exceed the guidance levels. In those cases, production-specific monitoring would be recommended to evaluate whether peak exposure may occur.



## Calibration Factor and Time-and-Distance Guidelines

### hazebase Base Hazer Pro with Faze Haze Fluid

Prepared for Froggy's Fog by ENVIRON International Corporation

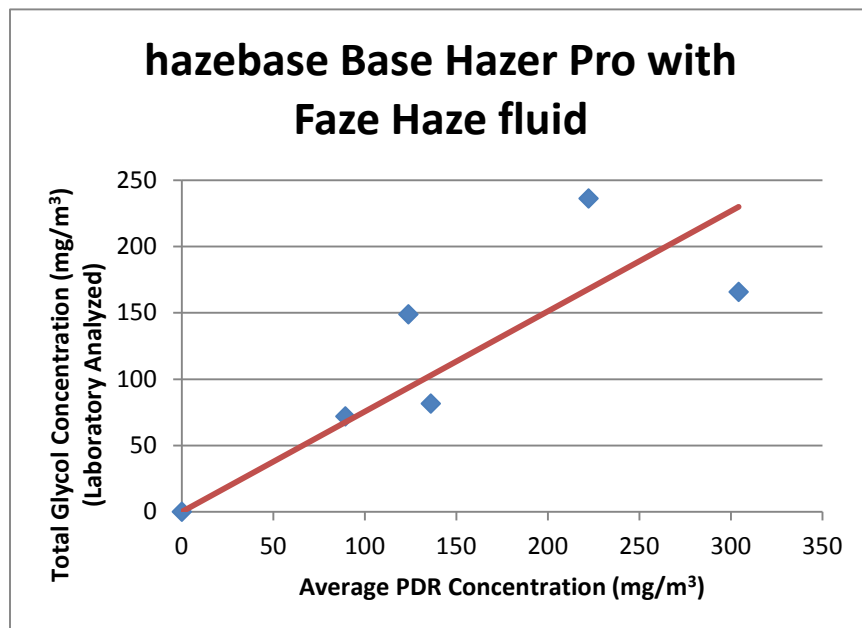
ENVIRON developed calibration factors and Time-and-Distance guidelines for the use of Froggy's Fog Faze Haze fluid in a hazebase Base Hazer Pro haze generator.

Faze Haze is a glycol-based fog fluid. Calibration factors were developed to allow a Thermo Scientific PDR-1000 aerosol monitor to be used to measure concentrations glycols in the air after being released from the Base Hazer Pro.

The measured concentrations should be compared against the peak exposure guidance level for glycols, which is 40 mg/m<sup>3</sup>.



The calibration curve for glycols is shown below:



**Figure 1.** Calibration curve for hazebase Base Hazer Pro with Faze Haze fluid, based on glycol laboratory data. Calibration factor, based on slope of curve, is 0.76 (mg/m<sup>3</sup> glycol) / (mg/m<sup>3</sup> aerosol).

<b>Summary of Calibration Factor</b>
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Manufacturer	Machine	Fluid	Fluid Type	Calibration Factor
hazebase	Base Hazer Pro	Faze Haze	Glycol	0.76

**Time and Distance Guidelines.** For various distances from the cue release point, the following table provides the average time (in seconds) after the end of the cue release after which the glycol concentrations will have fallen below the guidance levels. Thus, in order to prevent peak exposures to actors, the blocking and choreography should be arranged such that actors are not situated within a particular distance from the front of the fog release point until the amount of time listed in this table has elapsed following the end of the cue. For example, if a production is using the hazebase Base Hazer Pro/Faze Haze combination operating at an output setting of 99 and a fan setting of 99 with 60-second cue duration, an actor should not be situated within four to 16 feet from the front of the cue release point until at least 10 seconds following the end of the cue release.

Summary of Time-and-Distance Guidelines for Fog Generation hazebase Base Hazer Pro with Faze Haze Fluid							
Release Duration (secs)	Fan Speed	Output Setting	Time (in sec) After Which Air Concentrations Are Below Guidance Level (40 mg/m <sup>3</sup> )				
			4 ft	8 ft	12 ft	16 ft	20 ft
30	99	99	10	10	10	10	0
60	99	99	10	10	10	10	0
120	99	99	10	10	10	10	0
30	99	65	0	0	0	0	0
60	99	65	0	0	0	0	0
120	99	65	0	0	0	0	0
30	50	99	10	10	10	0	0
60	50	99	10	10	10	0	0
120	50	99	20	20	20	20	20
30	50	65	10	10	10	0	0
60	50	65	10	10	10	0	0
120	50	65	10	10	10	0	0
30	1	99	10	0	0	0	0
60	1	99	20	0	0	0	0
120	1	99	20	10	10	0	0
30	1	65	10	0	0	0	0
60	1	65	10	0	0	0	0
120	1	65	10	10	10	0	0

It should be reiterated that the Time-and-Distance Guidelines provided above are intended to allow a production to use the tested equipment and fluid combinations without conducting monitoring. However, these Guidelines may not be appropriate for all productions. Productions may want to use different configurations for positioning the machine (e.g., different heights), provide on-stage ventilation, or generate fog for a shorter or longer period of time. In addition, many productions may have other stage-specific conditions (e.g., on-stage activities and props that enhance dispersion) that would allow actors to be present in areas that are restricted under these Guidelines but which, in fact, do not exceed the guidance levels. In those cases, production-specific monitoring would be recommended to evaluate whether peak exposure may occur.



## Calibration Factor and Time-and-Distance Guidelines

### hazebase Base Hazer Pro with base hazer liquid Fluid

Prepared for Froggy's Fog by ENVIRON International Corporation

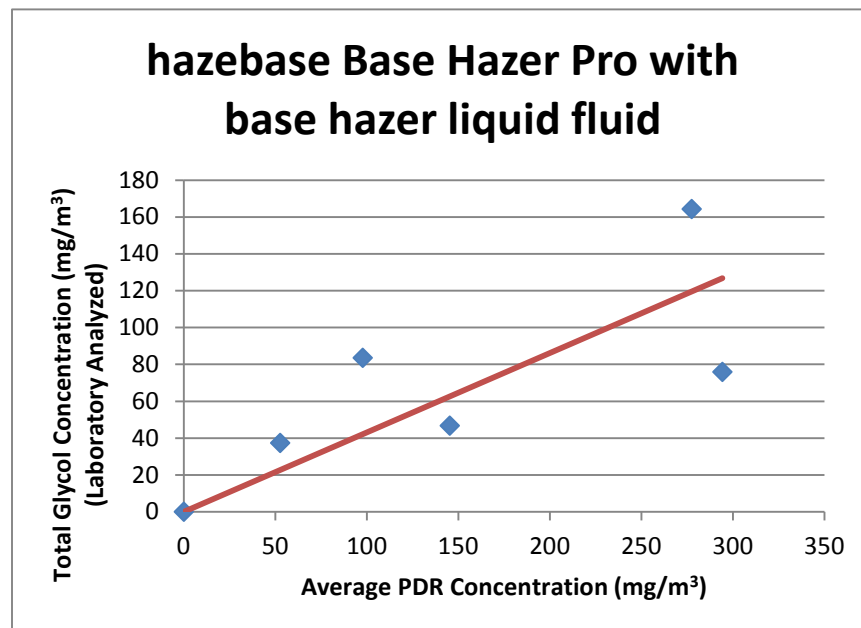
ENVIRON developed calibration factors and Time-and-Distance guidelines for the use of base hazer liquid in a hazebase Base Hazer Pro haze generator.

Base hazer liquid is a glycol-based fog fluid. Calibration factors were developed to allow a Thermo Scientific PDR-1000 aerosol monitor to be used to measure concentrations glycols in the air after being released from the Base Hazer Pro.

The measured concentrations should be compared against the peak exposure guidance level for glycols, which is 40 mg/m<sup>3</sup>.



The calibration curve for glycols is shown below:



**Figure 1.** Calibration curve for hazebase Base Hazer Pro with base hazer liquid fluid, based on glycol laboratory data. Calibration factor, based on slope of curve, is 0.43 (mg/m<sup>3</sup> glycol) / (mg/m<sup>3</sup> aerosol).

<b>Summary of Calibration Factor</b>
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Manufacturer	Machine	Fluid	Fluid Type	Calibration Factor
hazebase	Base Hazer Pro	base hazer liquid	Glycol	0.43

**Time and Distance Guidelines.** For various distances from the cue release point, the following table provides the average time (in seconds) after the end of the cue release after which the glycol concentrations will have fallen below the guidance levels. Thus, in order to prevent peak exposures to actors, the blocking and choreography should be arranged such that actors are not situated within a particular distance from the front of the fog release point until the amount of time listed in this table has elapsed following the end of the cue. For example, if a production is using the hazebase Base Hazer Pro/base hazer liquid fluid combination operating at an output setting of 99 and a fan setting of 99 with 60-second cue duration, an actor should not be situated within eight feet from the front of the cue release point until at least 10 seconds following the end of the cue release.

Summary of Time-and-Distance Guidelines for Fog Generation hazebase Base Hazer Pro with base hazer liquid Fluid							
Release Duration (secs)	Fan Speed	Output Setting	Time (in sec) After Which Air Concentrations Are Below Guidance Level (40 mg/m <sup>3</sup> )				
			8 ft	12 ft	16 ft	20 ft	25 ft
30	99	99	10	0	0	0	0
60	99	99	10	0	0	0	0
120	99	99	10	0	0	0	0
30	99	65	0	0	0	0	0
60	99	65	0	0	0	0	0
120	99	65	0	0	0	0	0
30	50	99	10	0	0	0	0
60	50	99	10	0	0	0	0
120	50	99	10	0	0	0	0
30	50	65	0	0	0	0	0
60	50	65	10	0	0	0	0
120	50	65	10	0	0	0	0
30	1	99	20	0	0	0	0
60	1	99	20	0	0	0	0
120	1	99	20	0	0	0	0
30	1	65	10	0	0	0	0
60	1	65	10	0	0	0	0
120	1	65	20	0	0	0	0

It should be reiterated that the Time-and-Distance Guidelines provided above are intended to allow a production to use the tested equipment and fluid combinations without conducting monitoring. However, these Guidelines may not be appropriate for all productions. Productions may want to use different configurations for positioning the machine (e.g., different heights), provide on-stage ventilation, or generate fog for a shorter or longer period of time. In addition, many productions may have other stage-specific conditions (e.g., on-stage activities and props that enhance dispersion) that would allow actors to be present in areas that are restricted under these Guidelines but which, in fact, do not exceed the guidance levels. In those cases, production-specific monitoring would be recommended to evaluate whether peak exposure may occur.





## Calibration Factor and Time-and-Distance Guidelines

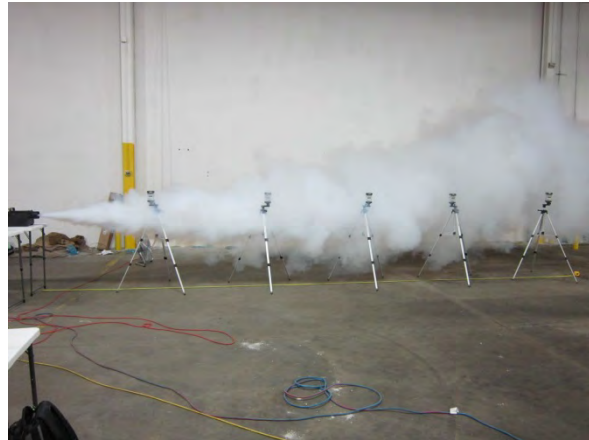
### hazebase Base High Power 220V with Backwood Bay Fluid

Prepared for Froggy's Fog by ENVIRON International Corporation

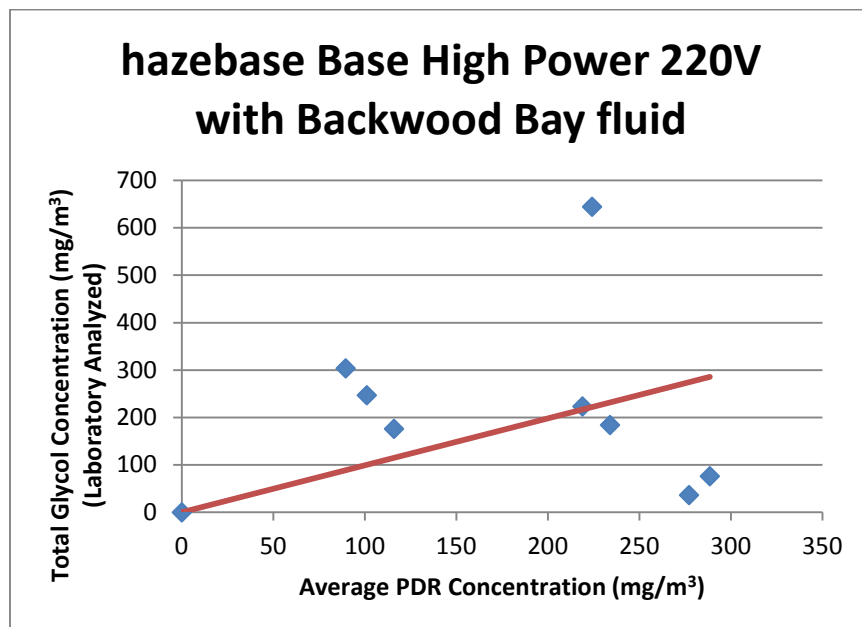
ENVIRON developed calibration factors and Time-and-Distance guidelines for the use of Froggy's Fog Backwood Bay fluid in a hazebase Base High Power 220V fog generator.

Backwood Bay is a glycol-based fog fluid. Calibration factors were developed to allow a Thermo Scientific PDR-1000 aerosol monitor to be used to measure concentrations glycols in the air after being released from the Base High Power 220V.

The measured concentrations should be compared against the peak exposure guidance level for glycols, which is 40 mg/m<sup>3</sup>.



The calibration curve for glycols is shown below:



**Figure 1.** Calibration curve for hazebase Base High Power 220V with Backwood Bay fluid, based on glycol laboratory data. Calibration factor, based on slope of curve, is 0.99 (mg/m<sup>3</sup> glycol) / (mg/m<sup>3</sup> aerosol).

Summary of Calibration Factor				
Manufacturer	Machine	Fluid	Fluid Type	Calibration Factor
hazebase	Base High Power 220V	Backwood Bay	Glycol	0.99

**Time and Distance Guidelines.** For various distances from the cue release point, the following table provides the average time (in seconds) after the end of the cue release after which the glycol concentrations will have fallen below the guidance levels. Thus, in order to prevent peak exposures to actors, the blocking and choreography should be arranged such that actors are not situated within a particular distance from the front of the fog release point until the amount of time listed in this table has elapsed following the end of the cue. For example, if a production is using the hazebase Base High Power 220V/Backwood Bay combination at 99% output with 15-second cue duration, an actor should not be situated within five to 25 feet from the front of the cue release point until at least 40 seconds following the end of the cue release.

Summary of Time-and-Distance Guidelines for Fog Generation hazebase Base High Power 220V with Backwood Bay Fluid						
Release Duration (secs)	Time (in sec) After Which Air Concentrations Are Below Guidance Level (40 mg/m <sup>3</sup> )					
	Machine Setting	5 ft	10 ft	15 ft	20 ft	25 ft
5	99%	40	40	40	40	40
15	99%	40	40	40	40	40
30*	99%	50	50	40	40	40
30	65%	20	0	0	0	0
60	65%	20	0	0	0	0
120	65%	>180	0	0	0	0
60	25%	0	0	0	0	0
120	25%	0	0	0	0	0

\*Machine had reduced output volume after 20 seconds

It should be reiterated that the Time-and-Distance Guidelines provided above are intended to allow a production to use the tested equipment and fluid combinations without conducting monitoring. However, these Guidelines may not be appropriate for all productions. Productions may want to use different configurations for positioning the machine (e.g., different heights), provide on-stage ventilation, or generate fog for a shorter or longer period of time. In addition, many productions may have other stage-specific conditions (e.g., on-stage activities and props that enhance dispersion) that would allow actors to be present in areas that are restricted under these Guidelines but which, in fact, do not exceed the guidance levels. In those cases, production-specific monitoring would be recommended to evaluate whether peak exposure may occur.



## Calibration Factor and Time-and-Distance Guidelines

### hazebase Base High Power 220V with Bog Fog Fluid

Prepared for Froggy's Fog by ENVIRON International Corporation

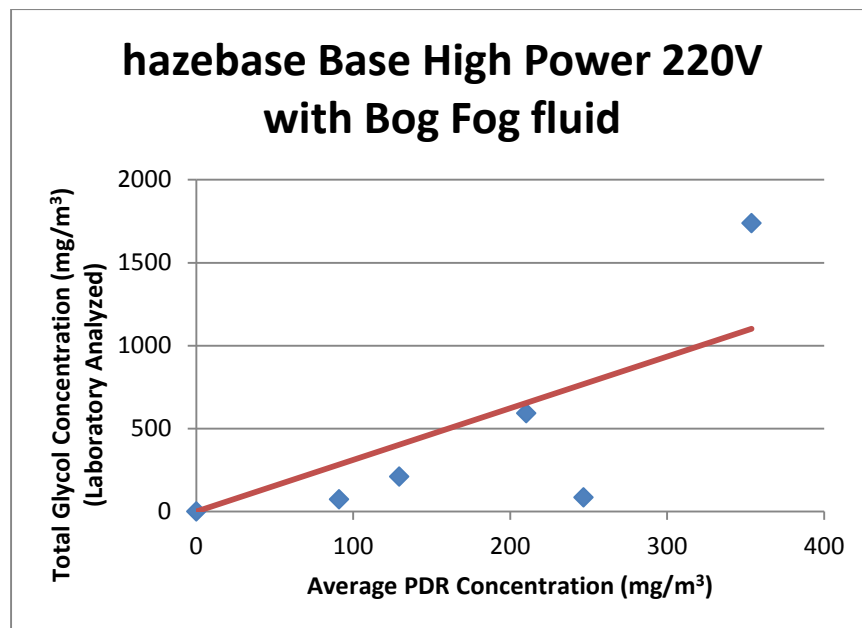
ENVIRON developed calibration factors and Time-and-Distance guidelines for the use of Froggy's Bog Fog fluid in a hazebase Base High Power 220V fog generator.

Bog Fog is a glycol-based fog fluid. Calibration factors were developed to allow a Thermo Scientific PDR-1000 aerosol monitor to be used to measure concentrations glycols in the air after being released from the Base High Power 220V.

The measured concentrations should be compared against the peak exposure guidance level for glycols, which is 40 mg/m<sup>3</sup>.



The calibration curve for glycols is shown below:



**Figure 1.** Calibration curve for hazebase Base High Power 220V with Bog Fog fluid, based on glycol laboratory data. Calibration factor, based on slope of curve, is 3.11 (mg/m<sup>3</sup> glycol) / (mg/m<sup>3</sup> aerosol).

Summary of Calibration Factor				
Manufacturer	Machine	Fluid	Fluid Type	Calibration Factor
hazebase	Base High Power 220V	Bog Fog	Glycol	3.11

**Time and Distance Guidelines.** For various distances from the cue release point, the following table provides the average time (in seconds) after the end of the cue release after which the glycol concentrations will have fallen below the guidance levels. Thus, in order to prevent peak exposures to actors, the blocking and choreography should be arranged such that actors are not situated within a particular distance from the front of the fog release point until the amount of time listed in this table has elapsed following the end of the cue. For example, if a production is using the hazebase Base High Power 220V/Bog Fog combination at 99% output with 15-second cue duration, an actor should not be situated within five feet from the front of the cue release point until at least 90 seconds following the end of the cue release.

Summary of Time-and-Distance Guidelines for Fog Generation hazebase Base High Power 220V with Bog Fog Fluid						
Release Duration (secs)	Time (in sec) After Which Air Concentrations Are Below Guidance Level (40 mg/m <sup>3</sup> )					
	Machine Setting	5 ft	10 ft	15 ft	20 ft	25 ft
5	99%	90	50	40	40	40
15	99%	90	50	40	40	40
30	99%	90	70	40	40	40
30	65%	60	0	0	0	0
60	65%	60	0	0	0	0
120	65%	60	0	0	0	0
60	25%	0	0	0	0	0
120	25%	0	0	0	0	0

It should be reiterated that the Time-and-Distance Guidelines provided above are intended to allow a production to use the tested equipment and fluid combinations without conducting monitoring. However, these Guidelines may not be appropriate for all productions. Productions may want to use different configurations for positioning the machine (e.g., different heights), provide on-stage ventilation, or generate fog for a shorter or longer period of time. In addition, many productions may have other stage-specific conditions (e.g., on-stage activities and props that enhance dispersion) that would allow actors to be present in areas that are restricted under these Guidelines but which, in fact, do not exceed the guidance levels. In those cases, production-specific monitoring would be recommended to evaluate whether peak exposure may occur.



# Calibration Factor and Time-and-Distance Guidelines

## hazebase Base Classic with Backwood Bay Fluid

Prepared for Froggy's Fog by ENVIRON International Corporation

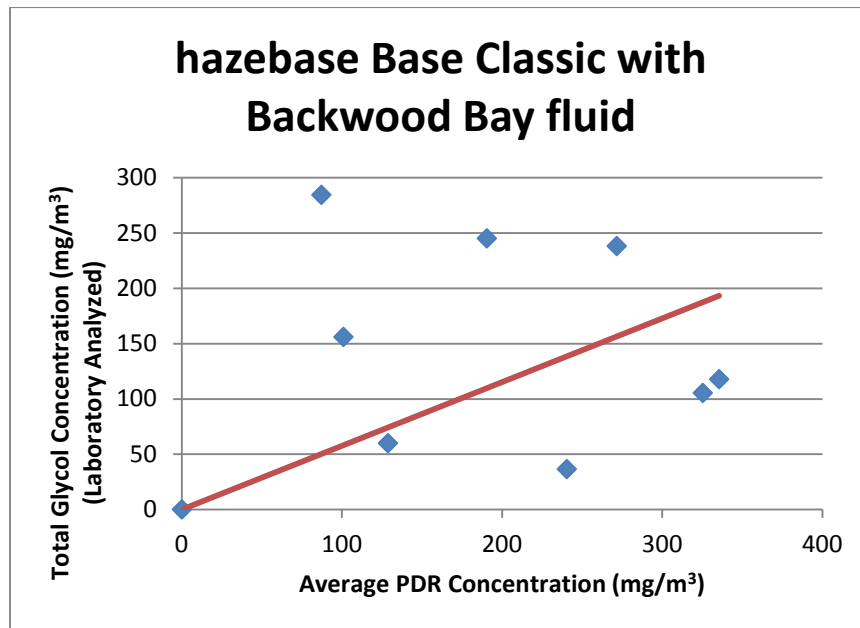
ENVIRON developed calibration factors and Time-and-Distance guidelines for the use of Froggy's Fog Backwood Bay fluid in a hazebase Base Classic fog generator.

Backwood Bay is a glycol-based fog fluid. Calibration factors were developed to allow a Thermo Scientific PDR-1000 aerosol monitor to be used to measure concentrations glycols in the air after being released from the Base Classic.

The measured concentrations should be compared against the peak exposure guidance level for glycols, which is 40 mg/m<sup>3</sup>.



The calibration curve for glycols is shown below:



**Figure 1.** Calibration curve for hazebase Base Classic with Backwood Bay fluid, based on glycol laboratory data. Calibration factor, based on slope of curve, is 0.58 (mg/m<sup>3</sup> glycol) / (mg/m<sup>3</sup> aerosol).

Summary of Calibration Factor				
Manufacturer	Machine	Fluid	Fluid Type	Calibration Factor
hazebase	Base Classic	Backwood Bay	Glycol	0.58

**Time and Distance Guidelines.** For various distances from the cue release point, the following table provides the average time (in seconds) after the end of the cue release after which the glycol concentrations will have fallen below the guidance levels. Thus, in order to prevent peak exposures to actors, the blocking and choreography should be arranged such that actors are not situated within a particular distance from the front of the fog release point until the amount of time listed in this table has elapsed following the end of the cue. For example, if a production is using the hazebase Base Classic/Backwood Bay combination at 99% output with 15-second cue duration, an actor should not be situated within five to 25 feet from the front of the cue release point until at least 30 seconds following the end of the cue release.

Summary of Time-and-Distance Guidelines for Fog Generation hazebase Base Classic with Backwood Bay Fluid						
Release Duration (secs)	Time (in sec) After Which Air Concentrations Are Below Guidance Level (40 mg/m <sup>3</sup> )					
	Machine Setting	5 ft	10 ft	15 ft	20 ft	25 ft
5	99%	30	30	30	30	30
15	99%	30	30	30	30	30
30*	99%	50	40	30	30	30
30	65%	50	10	0	0	0
60	65%	50	10	0	0	0
120	65%	50	10	0	0	0
60	25%	40	0	0	0	0
120	25%	40	0	0	0	0

\*Machine had reduced output volume after 20 seconds

It should be reiterated that the Time-and-Distance Guidelines provided above are intended to allow a production to use the tested equipment and fluid combinations without conducting monitoring. However, these Guidelines may not be appropriate for all productions. Productions may want to use different configurations for positioning the machine (e.g., different heights), provide on-stage ventilation, or generate fog for a shorter or longer period of time. In addition, many productions may have other stage-specific conditions (e.g., on-stage activities and props that enhance dispersion) that would allow actors to be present in areas that are restricted under these Guidelines but which, in fact, do not exceed the guidance levels. In those cases, production-specific monitoring would be recommended to evaluate whether peak exposure may occur.



# Calibration Factor and Time-and-Distance Guidelines

## hazebase Base Classic with Amusement Park Fluid Fluid

Prepared for Froggy's Fog by ENVIRON International Corporation

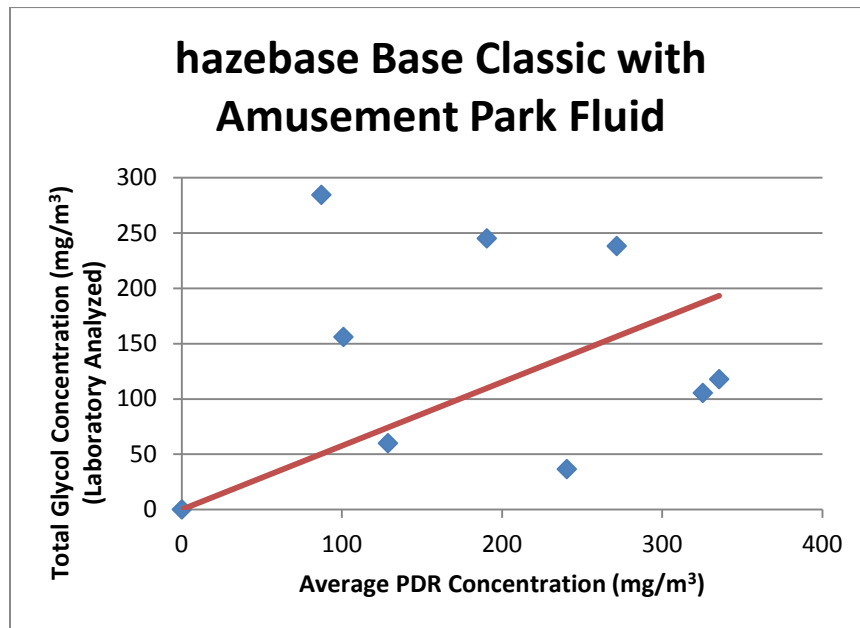
ENVIRON developed calibration factors and Time-and-Distance guidelines for the use of Froggy's Fog Amusement Park Fluid in a hazebase Base Classic fog generator.

Amusement Park Fluid is a glycol-based fog fluid. Calibration factors were developed to allow a Thermo Scientific PDR-1000 aerosol monitor to be used to measure concentrations glycols in the air after being released from the Base Classic.

The measured concentrations should be compared against the peak exposure guidance level for glycols, which is 40 mg/m<sup>3</sup>.



The calibration curve for glycols is shown below:



**Figure 1.** Calibration curve for hazebase Base Classic with Amusement Park Fluid, based on glycol laboratory data. Calibration factor, based on slope of curve, is 0.58 (mg/m<sup>3</sup> glycol) / (mg/m<sup>3</sup> aerosol).

Summary of Calibration Factor				
Manufacturer	Machine	Fluid	Fluid Type	Calibration Factor
hazebase	Base Classic	Amusement Park Fluid	Glycol	0.58

**Time and Distance Guidelines.** For various distances from the cue release point, the following table provides the average time (in seconds) after the end of the cue release after which the glycol concentrations will have fallen below the guidance levels. Thus, in order to prevent peak exposures to actors, the blocking and choreography should be arranged such that actors are not situated within a particular distance from the front of the fog release point until the amount of time listed in this table has elapsed following the end of the cue. For example, if a production is using the hazebase Base Classic/Amusement Park Fluid combination at 99% output with 15-second cue duration, an actor should not be situated within five to 25 feet from the front of the cue release point until at least 30 seconds following the end of the cue release.

Summary of Time-and-Distance Guidelines for Fog Generation hazebase Base Classic with Amusement Park Fluid						
Release Duration (secs)	Time (in sec) After Which Air Concentrations Are Below Guidance Level (40 mg/m <sup>3</sup> )					
	Machine Setting	5 ft	10 ft	15 ft	20 ft	25 ft
5	99%	30	30	30	30	30
15	99%	30	30	30	30	30
30*	99%	50	40	30	30	30
30	65%	50	10	0	0	0
60	65%	50	10	0	0	0
120	65%	50	10	0	0	0
60	25%	40	0	0	0	0
120	25%	40	0	0	0	0

\*Machine had reduced output volume after 20 seconds

It should be reiterated that the Time-and-Distance Guidelines provided above are intended to allow a production to use the tested equipment and fluid combinations without conducting monitoring. However, these Guidelines may not be appropriate for all productions. Productions may want to use different configurations for positioning the machine (e.g., different heights), provide on-stage ventilation, or generate fog for a shorter or longer period of time. In addition, many productions may have other stage-specific conditions (e.g., on-stage activities and props that enhance dispersion) that would allow actors to be present in areas that are restricted under these Guidelines but which, in fact, do not exceed the guidance levels. In those cases, production-specific monitoring would be recommended to evaluate whether peak exposure may occur.





# Calibration Factor and Time-and-Distance Guidelines

## hazebase Base Classic with Bog Fog Fluid

Prepared for Froggy's Fog by ENVIRON International Corporation

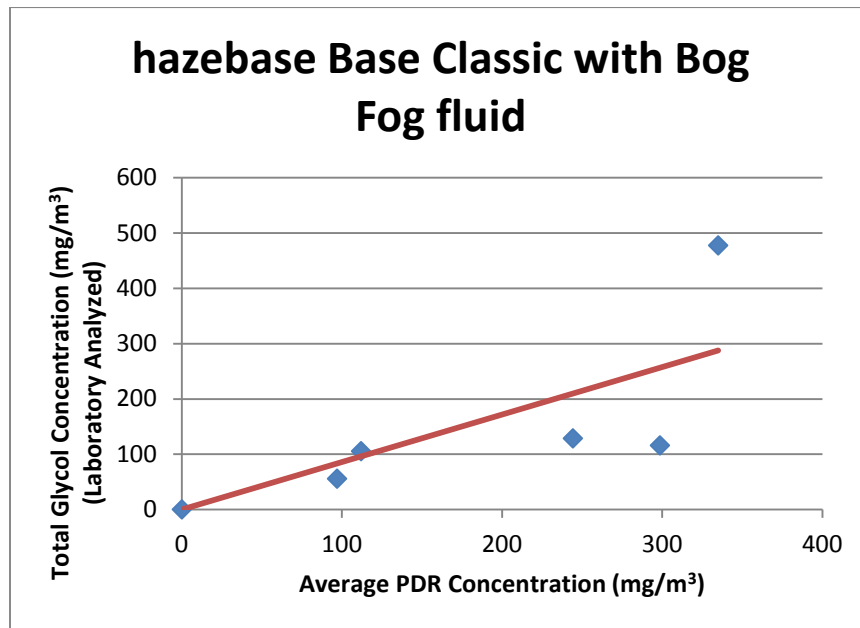
ENVIRON developed calibration factors and Time-and-Distance guidelines for the use of Froggy's Fog Bog Fog fluid in a hazebase Base Classic fog generator.

Bog Fog is a glycol-based fog fluid. Calibration factors were developed to allow a Thermo Scientific PDR-1000 aerosol monitor to be used to measure concentrations glycols in the air after being released from the Base Classic.

The measured concentrations should be compared against the peak exposure guidance level for glycols, which is 40 mg/m<sup>3</sup>.



The calibration curve for glycols is shown below:



**Figure 1.** Calibration curve for hazebase Base Classic with Bog Fog fluid, based on glycol laboratory data. Calibration factor, based on slope of curve, is 0.86 (mg/m<sup>3</sup> glycol) / (mg/m<sup>3</sup> aerosol).

<b>Summary of Calibration Factor</b>				
<b>Manufacturer</b>	<b>Machine</b>	<b>Fluid</b>	<b>Fluid Type</b>	<b>Calibration Factor</b>
hazebase	Base Classic	Bog Fog	Glycol	0.86

**Time and Distance Guidelines.** For various distances from the cue release point, the following table provides the average time (in seconds) after the end of the cue release after which the glycol concentrations will have fallen below the guidance levels. Thus, in order to prevent peak exposures to actors, the blocking and choreography should be arranged such that actors are not situated within a particular distance from the front of the fog release point until the amount of time listed in this table has elapsed following the end of the cue. For example, if a production is using the hazebase Base Classic/Bog Fog combination at 99% output with 15-second cue duration, an actor should not be situated within five to 25 feet from the front of the cue release point until at least 50 seconds following the end of the cue release.

<b>Summary of Time-and-Distance Guidelines for Fog Generation</b>						
<b>hazebase Base Classic with Bog Fog Fluid</b>						
<b>Release Duration (secs)</b>	<b>Output Setting</b>	<b>Time (in sec) After Which Air Concentrations Are Below Guidance Level (40 mg/m<sup>3</sup>)</b>				
		<b>5 ft</b>	<b>10 ft</b>	<b>15 ft</b>	<b>20 ft</b>	<b>25 ft</b>
5	99%	40	40	40	30	30
15	99%	50	50	50	50	50
30	99%	70	50	50	50	50
30	65%	70	0	0	0	0
60	65%	70	0	0	0	0
120	65%	70	0	0	0	0
60	25%	0	0	0	0	0
120	25%	0	0	0	0	0

It should be reiterated that the Time-and-Distance Guidelines provided above are intended to allow a production to use the tested equipment and fluid combinations without conducting monitoring. However, these Guidelines may not be appropriate for all productions. Productions may want to use different configurations for positioning the machine (e.g., different heights), provide on-stage ventilation, or generate fog for a shorter or longer period of time. In addition, many productions may have other stage-specific conditions (e.g., on-stage activities and props that enhance dispersion) that would allow actors to be present in areas that are restricted under these Guidelines but which, in fact, do not exceed the guidance levels. In those cases, production-specific monitoring would be recommended to evaluate whether peak exposure may occur.



# Calibration Factor and Time-and-Distance Guidelines

## hazebase Base Classic with Velocity Fluid

Prepared for Froggy's Fog by ENVIRON International Corporation

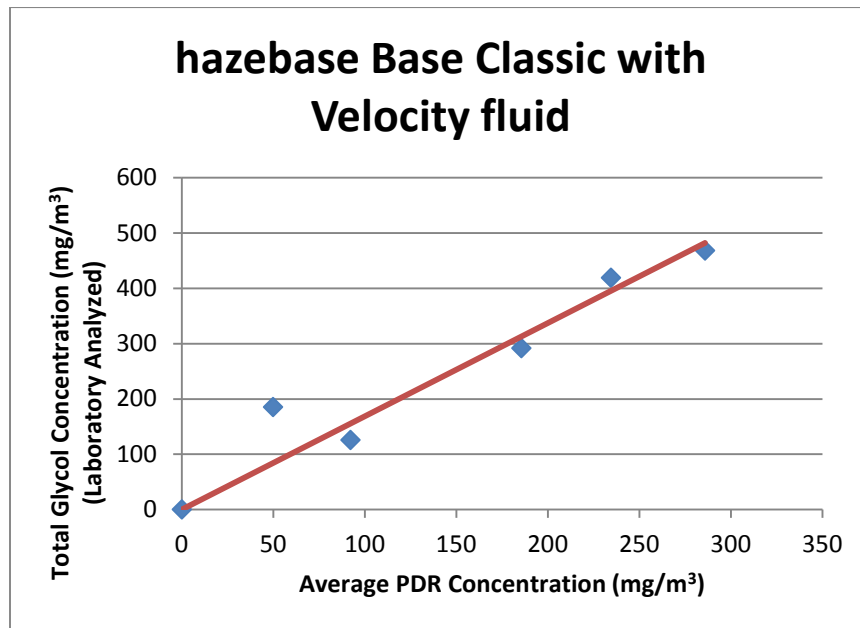
ENVIRON developed calibration factors and Time-and-Distance guidelines for the use of Froggy's Fog Velocity fluid in a hazebase Base Classic fog generator.

Velocity is a glycol-based fog fluid. Calibration factors were developed to allow a Thermo Scientific PDR-1000 aerosol monitor to be used to measure concentrations glycols in the air after being released from the Base Classic.

The measured concentrations should be compared against the peak exposure guidance level for glycols, which is 40 mg/m<sup>3</sup>.



The calibration curve for glycols is shown below:



**Figure 1.** Calibration curve for hazebase Base Classic with Velocity fluid, based on glycol laboratory data. Calibration factor, based on slope of curve, is 1.69 (mg/m<sup>3</sup> glycol) / (mg/m<sup>3</sup> aerosol).

<b>Summary of Calibration Factor</b>				
<b>Manufacturer</b>	<b>Machine</b>	<b>Fluid</b>	<b>Fluid Type</b>	<b>Calibration Factor</b>
hazebase	Base Classic	Velocity	Glycol	1.69

**Time and Distance Guidelines.** For various distances from the cue release point, the following table provides the average time (in seconds) after the end of the cue release after which the glycol concentrations will have fallen below the guidance levels. Thus, in order to prevent peak exposures to actors, the blocking and choreography should be arranged such that actors are not situated within a particular distance from the front of the fog release point until the amount of time listed in this table has elapsed following the end of the cue. For example, if a production is using the hazebase Base Classic/Velocity combination at 99% output with 15-second cue duration, an actor should not be situated within five to 25 feet from the front of the cue release point until at least 20 seconds following the end of the cue release.

<b>Summary of Time-and-Distance Guidelines for Fog Generation hazebase Base Classic with Velocity Fluid</b>						
<b>Release Duration (secs)</b>	<b>Time (in sec) After Which Air Concentrations Are Below Guidance Level (40 mg/m<sup>3</sup>)</b>					
	<b>Machine Setting</b>	<b>5 ft</b>	<b>10 ft</b>	<b>15 ft</b>	<b>20 ft</b>	<b>25 ft</b>
5	99%	0	0	0	0	0
15	99%	20	20	20	20	20
30	99%	30	20	20	20	20
30	65%	30	0	0	0	0
60	65%	30	10	0	0	0
120	65%	30	10	0	0	0
60	25%	0	0	0	0	0
120	25%	0	0	0	0	0

It should be reiterated that the Time-and-Distance Guidelines provided above are intended to allow a production to use the tested equipment and fluid combinations without conducting monitoring. However, these Guidelines may not be appropriate for all productions. Productions may want to use different configurations for positioning the machine (e.g., different heights), provide on-stage ventilation, or generate fog for a shorter or longer period of time. In addition, many productions may have other stage-specific conditions (e.g., on-stage activities and props that enhance dispersion) that would allow actors to be present in areas that are restricted under these Guidelines but which, in fact, do not exceed the guidance levels. In those cases, production-specific monitoring would be recommended to evaluate whether peak exposure may occur.



## Calibration Factor and Time-and-Distance Guidelines

### hazebase Base Classic with Cryo Freeze Fluid

Prepared for Froggy's Fog by ENVIRON International Corporation

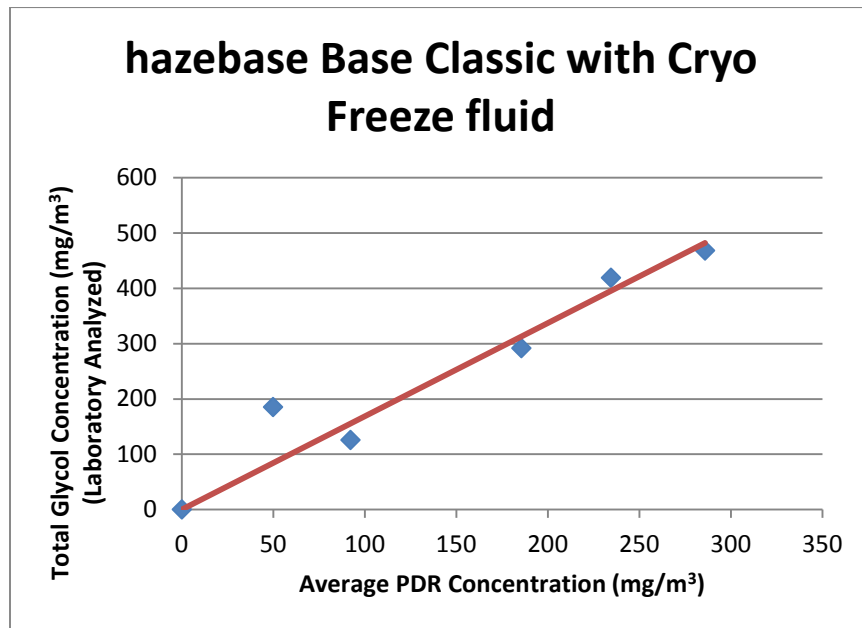
ENVIRON developed calibration factors and Time-and-Distance guidelines for the use of Froggy's Fog Cryo Freeze fluid in a hazebase Base Classic fog generator.

Cryo Freeze is a glycol-based fog fluid. Calibration factors were developed to allow a Thermo Scientific PDR-1000 aerosol monitor to be used to measure concentrations glycols in the air after being released from the Base Classic.

The measured concentrations should be compared against the peak exposure guidance level for glycols, which is 40 mg/m<sup>3</sup>.



The calibration curve for glycols is shown below:



**Figure 1.** Calibration curve for hazebase Base Classic with Cryo Freeze fluid, based on glycol laboratory data. Calibration factor, based on slope of curve, is 1.69 (mg/m<sup>3</sup> glycol) / (mg/m<sup>3</sup> aerosol).

Summary of Calibration Factor				
Manufacturer	Machine	Fluid	Fluid Type	Calibration Factor
hazebase	Base Classic	Cryo Freeze	Glycol	1.69

**Time and Distance Guidelines.** For various distances from the cue release point, the following table provides the average time (in seconds) after the end of the cue release after which the glycol concentrations will have fallen below the guidance levels. Thus, in order to prevent peak exposures to actors, the blocking and choreography should be arranged such that actors are not situated within a particular distance from the front of the fog release point until the amount of time listed in this table has elapsed following the end of the cue. For example, if a production is using the hazebase Base Classic/Cryo Freeze combination at 99% output with 15-second cue duration, an actor should not be situated within five to 25 feet from the front of the cue release point until at least 20 seconds following the end of the cue release.

Summary of Time-and-Distance Guidelines for Fog Generation hazebase Base Classic with Cryo Freeze Fluid						
Release Duration (secs)	Time (in sec) After Which Air Concentrations Are Below Guidance Level (40 mg/m <sup>3</sup> )					
	Machine Setting	5 ft	10 ft	15 ft	20 ft	25 ft
5	99%	0	0	0	0	0
15	99%	20	20	20	20	20
30	99%	30	20	20	20	20
30	65%	30	0	0	0	0
60	65%	30	10	0	0	0
120	65%	30	10	0	0	0
60	25%	0	0	0	0	0
120	25%	0	0	0	0	0

It should be reiterated that the Time-and-Distance Guidelines provided above are intended to allow a production to use the tested equipment and fluid combinations without conducting monitoring. However, these Guidelines may not be appropriate for all productions. Productions may want to use different configurations for positioning the machine (e.g., different heights), provide on-stage ventilation, or generate fog for a shorter or longer period of time. In addition, many productions may have other stage-specific conditions (e.g., on-stage activities and props that enhance dispersion) that would allow actors to be present in areas that are restricted under these Guidelines but which, in fact, do not exceed the guidance levels. In those cases, production-specific monitoring would be recommended to evaluate whether peak exposure may occur.



# Calibration Factor and Time-and-Distance Guidelines

## hazebase Base Classic with Quick Blast Fluid

Prepared for Froggy's Fog by ENVIRON International Corporation

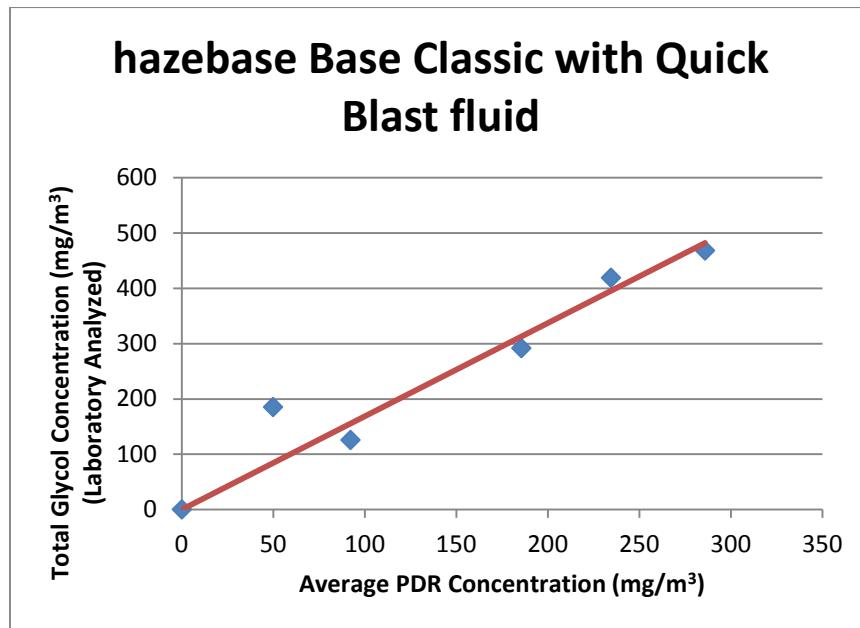
ENVIRON developed calibration factors and Time-and-Distance guidelines for the use of Froggy's Fog Quick Blast fluid in a hazebase Base Classic fog generator.

Quick Blast is a glycol-based fog fluid. Calibration factors were developed to allow a Thermo Scientific PDR-1000 aerosol monitor to be used to measure concentrations glycols in the air after being released from the Base Classic.

The measured concentrations should be compared against the peak exposure guidance level for glycols, which is 40 mg/m<sup>3</sup>.



The calibration curve for glycols is shown below:



**Figure 1.** Calibration curve for hazebase Base Classic with Quick Blast fluid, based on glycol laboratory data. Calibration factor, based on slope of curve, is 1.69 (mg/m<sup>3</sup> glycol) / (mg/m<sup>3</sup> aerosol).

Summary of Calibration Factor				
Manufacturer	Machine	Fluid	Fluid Type	Calibration Factor
hazebase	Base Classic	Quick Blast	Glycol	1.69

**Time and Distance Guidelines.** For various distances from the cue release point, the following table provides the average time (in seconds) after the end of the cue release after which the glycol concentrations will have fallen below the guidance levels. Thus, in order to prevent peak exposures to actors, the blocking and choreography should be arranged such that actors are not situated within a particular distance from the front of the fog release point until the amount of time listed in this table has elapsed following the end of the cue. For example, if a production is using the hazebase Base Classic/Quick Blast combination at 99% output with 15-second cue duration, an actor should not be situated within five to 25 feet from the front of the cue release point until at least 20 seconds following the end of the cue release.

Summary of Time-and-Distance Guidelines for Fog Generation hazebase Base Classic with Quick Blast Fluid						
Release Duration (secs)	Time (in sec) After Which Air Concentrations Are Below Guidance Level (40 mg/m <sup>3</sup> )					
	Machine Setting	5 ft	10 ft	15 ft	20 ft	25 ft
5	99%	0	0	0	0	0
15	99%	20	20	20	20	20
30	99%	30	20	20	20	20
30	65%	30	0	0	0	0
60	65%	30	10	0	0	0
120	65%	30	10	0	0	0
60	25%	0	0	0	0	0
120	25%	0	0	0	0	0

It should be reiterated that the Time-and-Distance Guidelines provided above are intended to allow a production to use the tested equipment and fluid combinations without conducting monitoring. However, these Guidelines may not be appropriate for all productions. Productions may want to use different configurations for positioning the machine (e.g., different heights), provide on-stage ventilation, or generate fog for a shorter or longer period of time. In addition, many productions may have other stage-specific conditions (e.g., on-stage activities and props that enhance dispersion) that would allow actors to be present in areas that are restricted under these Guidelines but which, in fact, do not exceed the guidance levels. In those cases, production-specific monitoring would be recommended to evaluate whether peak exposure may occur.





## Calibration Factor and Time-and-Distance Guidelines

### LeMaitre Neutron XS with Neutronic Haze Fluid

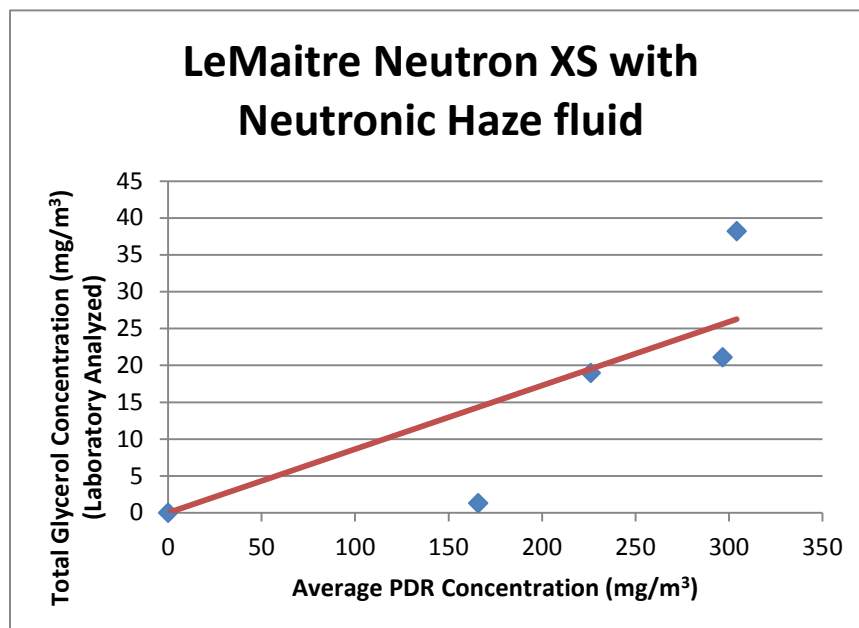
Prepared for Froggy's Fog by ENVIRON International Corporation

ENVIRON developed calibration factors and Time-and-Distance guidelines for the use of Froggy's Fog Neutronic Haze fluid in a LeMaitre Neutron XS haze generator.

Neutronic Haze is a glycerol-based fog fluid. Calibration factors were developed to allow a Thermo Scientific PDR-1000 aerosol monitor to be used to measure concentrations glycerols in the air after being released from the Neutron XS.

The measured concentrations should be compared against the peak exposure guidance level for glycerols, which is 50 mg/m<sup>3</sup>.

The calibration curve for glycerols is shown below:



**Figure 1.** Calibration curve for LeMaitre Neutron XS with Neutronic Haze fluid, based on glycerol laboratory data. Calibration factor, based on slope of curve, is 0.09 (mg/m<sup>3</sup> glycerol) / (mg/m<sup>3</sup> aerosol).

Summary of Calibration Factor				
Manufacturer	Machine	Fluid	Fluid Type	Calibration Factor
LeMaitre	Neutron XS	Neutronic Haze	Glycerol	0.09

**Time and Distance Guidelines.** For various distances from the cue release point, the following table provides the average time (in seconds) after the end of the cue release after which the glycerol concentrations will have fallen below the guidance levels. Thus, in order to prevent peak exposures to actors, the blocking and choreography should be arranged such that actors are not situated within a particular distance from the front of the fog release point until the amount of time listed in this table has elapsed following the end of the cue. For example, if a production is using the LeMaitre Neutron XS/Neutronic Haze combination with 30-second cue duration, an actor may be situated as little as 3 feet from the front of the cue release point immediately following the end of the cue release.

Summary of Time-and-Distance Guidelines for Fog Generation LeMaitre Neutron XS with Neutronic Haze Fluid						
Release Duration (secs)	Output Setting	Time (in sec) After Which Air Concentrations Are Below Guidance Level (50 mg/m <sup>3</sup> )				
		3 ft	6 ft	9 ft	12 ft	15 ft
30	Full	0	0	0	0	0
60	Full	0	0	0	0	0
120	Full	0	0	0	0	0

It should be reiterated that the Time-and-Distance Guidelines provided above are intended to allow a production to use the tested equipment and fluid combinations without conducting monitoring. However, these Guidelines may not be appropriate for all productions. Productions may want to use different configurations for positioning the machine (e.g., different heights), provide on-stage ventilation, or generate fog for a shorter or longer period of time. In addition, many productions may have other stage-specific conditions (e.g., on-stage activities and props that enhance dispersion) that would allow actors to be present in areas that are restricted under these Guidelines but which, in fact, do not exceed the guidance levels. In those cases, production-specific monitoring would be recommended to evaluate whether peak exposure may occur.



# Calibration Factor and Time-and-Distance Guidelines

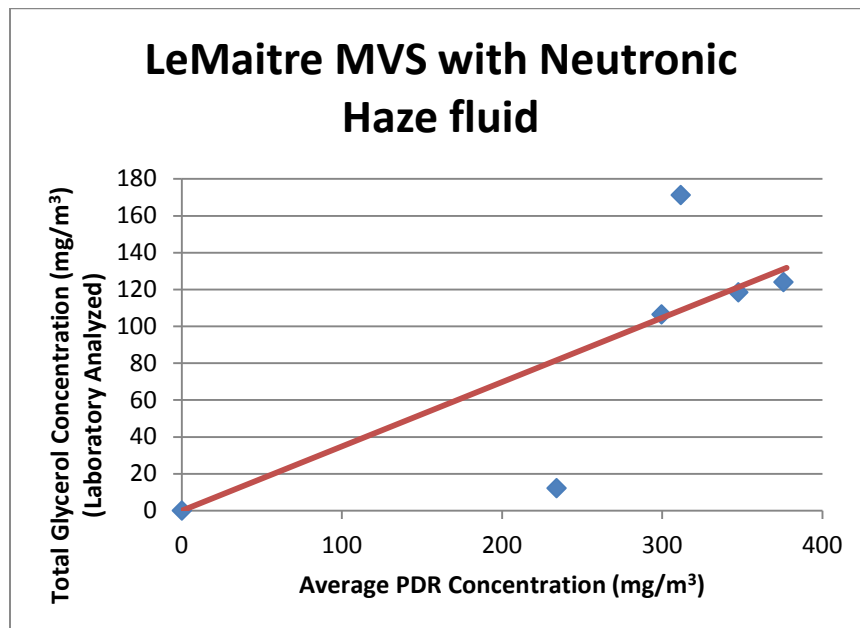
## LeMaitre MVS with Neutronic Haze Fluid

Prepared for Froggy's Fog by ENVIRON International Corporation

ENVIRON developed calibration factors and Time-and-Distance guidelines for the use of Froggy's Fog Neutronic Haze fluid in a LeMaitre MVS haze generator.

Neutronic Haze is a glycerol-based fog fluid. Calibration factors were developed to allow a Thermo Scientific PDR-1000 aerosol monitor to be used to measure concentrations glycerols in the air after being released from the MVS.

The measured concentrations should be compared against the peak exposure guidance level for glycerols, which is 50 mg/m<sup>3</sup>. The calibration curve for glycerols is shown below:



**Figure 1.** Calibration curve for LeMaitre MVS with Neutronic Haze fluid, based on glycerol laboratory data. Calibration factor, based on slope of curve, is 0.35 (mg/m<sup>3</sup> glycerol) / (mg/m<sup>3</sup> aerosol).

Summary of Calibration Factor				
Manufacturer	Machine	Fluid	Fluid Type	Calibration Factor
LeMaitre	MVS	Neutronic Haze	Glycerol	0.35

**Time and Distance Guidelines.** For various distances from the cue release point, the following table provides the average time (in seconds) after the end of the cue release after which the glycerol concentrations will have fallen below the guidance levels. Thus, in order to prevent peak exposures to actors, the blocking and choreography should be arranged such that actors are not situated within a particular distance from the front of the fog release point until the amount of time listed in this table has elapsed following the end of the cue. For example, if a production is using the LeMaitre MVS/Neutronic Haze combination operating at an output setting of 15 and a fan setting of 15 with 60-second cue duration, an actor should not be situated within five to 10 feet from the front of the cue release point until at least 10 seconds following the end of the cue release.

Summary of Time-and-Distance Guidelines for Fog Generation							
LeMaitre MVS with Neutronic Haze fluid							
Release Duration (secs)	Fan Speed	Output Setting	Time (in sec) After Which Air Concentrations Are Below Guidance Level (50 mg/m <sup>3</sup> )				
			3 ft	5 ft	7 ft	10 ft	15 ft
30*	15	15	20	10	0	0	0
60	15	15	20	10	10	10	0
120	15	15	20	10	10	10	10
30	15	10	20	10	0	0	0
60	15	10	20	10	10	10	0
120	15	10	20	10	10	10	10
30*	15	5	0	0	0	0	0
60	15	5	10	10	10	0	0
120	15	5	10	10	10	0	0
30*	7	15	20	20	20	0	0
60	7	15	20	20	20	20	20
120	7	15	20	20	20	20	20
30*	7	10	20	10	0	0	0
60	7	10	20	10	10	10	10
120	7	10	20	10	10	10	10
30*	1	15	0	0	0	0	0
60	1	15	20	20	20	20	0
120	1	15	20	20	20	20	0
30*	1	10	0	0	0	0	0
60	1	10	20	20	20	20	0
120	1	10	20	20	20	20	0

\*Machine takes 20 seconds to release fog after button is pressed

It should be reiterated that the Time-and-Distance Guidelines provided above are intended to allow a production to use the tested equipment and fluid combinations without conducting monitoring. However, these Guidelines may not be appropriate for all productions. Productions may want to use different configurations for positioning the machine (e.g., different heights), provide on-stage ventilation, or generate fog for a shorter or longer period of time. In addition, many productions may have other stage-specific conditions (e.g., on-stage activities and props that enhance dispersion) that would allow actors to be present in areas that are restricted under these Guidelines but which, in fact, do not exceed the guidance levels. In those cases, production-specific monitoring would be recommended to evaluate whether peak exposure may occur.



# Calibration Factor and Time-and-Distance Guidelines

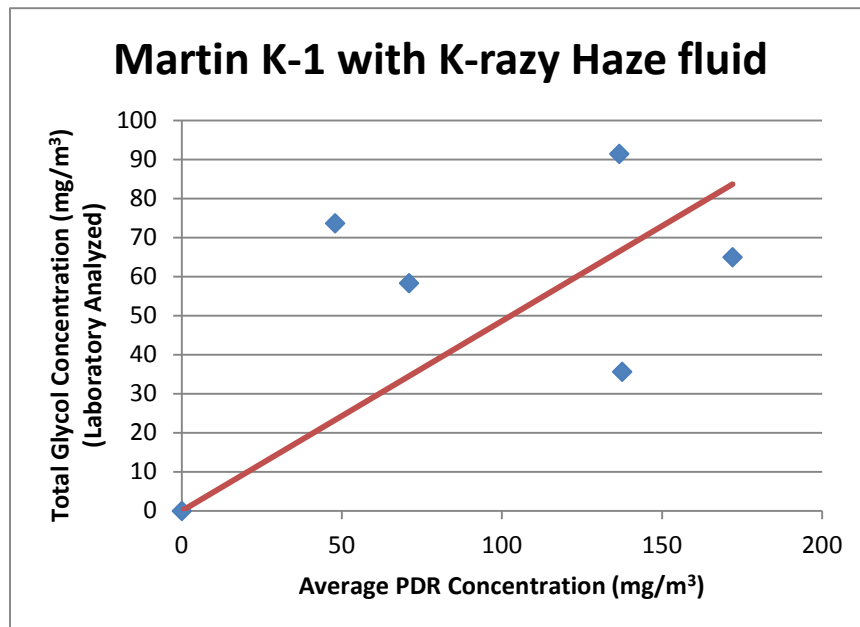
## Martin K-1 with K-razy Haze Fluid

Prepared for Froggy's Fog by ENVIRON International Corporation

ENVIRON developed calibration factors and Time-and-Distance guidelines for the use of Froggy's Fog K-razy Haze fluid in a Martin K-1 haze generator.

K-razy Haze is a glycol-based fog fluid. Calibration factors were developed to allow a Thermo Scientific PDR-1000 aerosol monitor to be used to measure concentrations glycols in the air after being released from the K-1.

The measured concentrations should be compared against the peak exposure guidance level for glycols, which is 40 mg/m<sup>3</sup>. The calibration curve for glycols is shown below:



**Figure 1.** Calibration curve for Martin K-1 with K-razy Haze fluid, based on glycol laboratory data. Calibration factor, based on slope of curve, is 0.49 (mg/m<sup>3</sup> glycol) / (mg/m<sup>3</sup> aerosol).

Summary of Calibration Factor				
Manufacturer	Machine	Fluid	Fluid Type	Calibration Factor
Martin	K-1	K-razy Haze	Glycol	0.49

**Time and Distance Guidelines.** For various distances from the cue release point, the following table provides the average time (in seconds) after the end of the cue release after which the glycol concentrations will have fallen below the guidance levels. Thus, in order to prevent peak exposures to actors, the blocking and choreography should be arranged such that actors are not situated within a particular distance from the front of the fog release point until the amount of time listed in this table has elapsed following the end of the cue. For example, if a production is using the Martin K-1/K-razy Haze combination operating at an output setting of 100% and a fan setting of 100 with 120-second cue duration, an actor may be situated as little as 3 feet from the front of the cue release point immediately following the end of the cue release. For the Martin K-1/K-razy Haze combination, time-and-distance testing was based on the machine being positioned on the floor.

Summary of Time-and-Distance Guidelines for Fog Generation							
Martin K-1 with K-razy Haze Fluid							
Release Duration (secs)	Fan Speed*	Output Setting*	Time (in sec) After Which Air Concentrations Are Below Guidance Level (40 mg/m <sup>3</sup> )				
			3 ft	5 ft	7 ft	10 ft	15 ft
30	100	100%	0	0	0	0	0
60	100	100%	0	0	0	0	0
120	100	100%	0	0	0	0	0
30	100	65%	0	0	0	0	0
60	100	65%	0	0	0	0	0
120	100	65%	0	0	0	0	0
30	100	25%	0	0	0	0	0
60	100	25%	0	0	0	0	0
120	100	25%	0	0	0	0	0
30	50	65%	0	0	0	0	0
60	50	65%	0	0	0	0	0
120	50	65%	0	0	0	0	0
30	50	25%	0	0	0	0	0
60	50	25%	0	0	0	0	0
120	50	25%	0	0	0	0	0
30	10	65%	0	0	0	0	0
60	10	65%	0	0	0	0	0
120	10	65%	0	0	0	0	0
30	10	25%	0	0	0	0	0
60	10	25%	0	0	0	0	0
120	10	25%	0	0	0	0	0

\*All fan speeds and output settings approximate. DMX controller was used during testing.

It should be reiterated that the Time-and-Distance Guidelines provided above are intended to allow a production to use the tested equipment and fluid combinations without conducting monitoring. However, these Guidelines may not be appropriate for all productions. Productions may want to use different configurations for positioning the machine (e.g., different heights), provide on-stage ventilation, or generate fog for a shorter or longer period of time. In addition, many productions may have other stage-specific conditions (e.g., on-stage activities and props that enhance dispersion) that would allow actors to be present in areas that are restricted under these Guidelines but which, in fact, do not exceed the guidance levels. In those cases, production-specific monitoring would be recommended to evaluate whether peak exposure may occur.



## Calibration Factor and Time-and-Distance Guidelines

### Martin Magnum 2000 with Backwood Bay Fluid

Prepared for Froggy's Fog by ENVIRON International Corporation

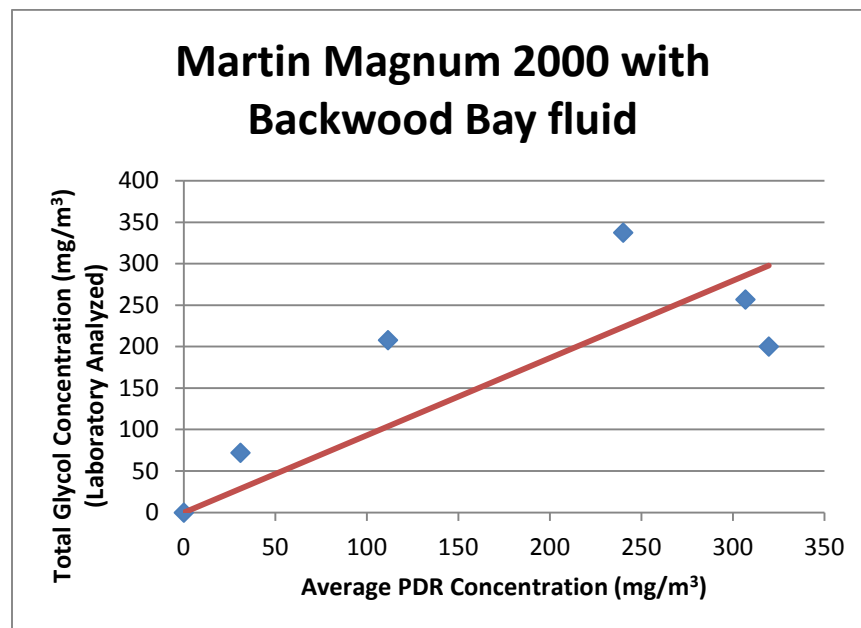
ENVIRON developed calibration factors and Time-and-Distance guidelines for the use of Froggy's Fog Backwood Bay fluid in a Martin Magnum 2000 fog generator.

Backwood Bay is a glycol-based fog fluid. Calibration factors were developed to allow a Thermo Scientific PDR-1000 aerosol monitor to be used to measure concentrations glycols in the air after being released from the Magnum 2000.

The measured concentrations should be compared against the peak exposure guidance level for glycols, which is  $40 \text{ mg/m}^3$ .



The calibration curve for glycols is shown below:



**Figure 1.** Calibration curve for Martin Magnum 2000 with Backwood Bay fluid, based on glycol laboratory data. Calibration factor, based on slope of curve, is  $0.93 \text{ (mg/m}^3 \text{ glycol) / (mg/m}^3 \text{ aerosol)}$ .

Summary of Calibration Factor				
Manufacturer	Machine	Fluid	Fluid Type	Calibration Factor
Martin	Magnum 2000	Backwood Bay	Glycol	0.93

**Time and Distance Guidelines.** For various distances from the cue release point, the following table provides the average time (in seconds) after the end of the cue release after which the glycol concentrations will have fallen below the guidance levels. Thus, in order to prevent peak exposures to actors, the blocking and choreography should be arranged such that actors are not situated within a particular distance from the front of the fog release point until the amount of time listed in this table has elapsed following the end of the cue. For example, if a production is using the Martin Magnum 2000/Backwood Bay combination at maximum output with 15-second cue duration, an actor should not be situated within five to 10 feet from the front of the cue release point until at least 70 seconds following the end of the cue release.

Summary of Time-and-Distance Guidelines for Fog Generation Martin Magnum 2000 with Backwood Bay Fluid						
Release Duration (secs)	Time (in sec) After Which Air Concentrations Are Below Guidance Level (40 mg/m <sup>3</sup> )					
	Machine Setting*	5 ft	10 ft	15 ft	20 ft	25 ft
5	Max	60	60	60	50	50
15	Max	70	70	60	50	50
30†	Max	70	70	60	50	50
30‡	Mid	60	60	10	0	0
60‡	Mid	70	70	70	0	0

\*No output at minimum setting

†Machine turned off 17 seconds into run

‡Machine turned on and off after 28 seconds

It should be reiterated that the Time-and-Distance Guidelines provided above are intended to allow a production to use the tested equipment and fluid combinations without conducting monitoring. However, these Guidelines may not be appropriate for all productions. Productions may want to use different configurations for positioning the machine (e.g., different heights), provide on-stage ventilation, or generate fog for a shorter or longer period of time. In addition, many productions may have other stage-specific conditions (e.g., on-stage activities and props that enhance dispersion) that would allow actors to be present in areas that are restricted under these Guidelines but which, in fact, do not exceed the guidance levels. In those cases, production-specific monitoring would be recommended to evaluate whether peak exposure may occur.





## Calibration Factor and Time-and-Distance Guidelines

### Martin Magnum 2000 with Bog Fog Fluid

Prepared for Froggy's Fog by ENVIRON International Corporation

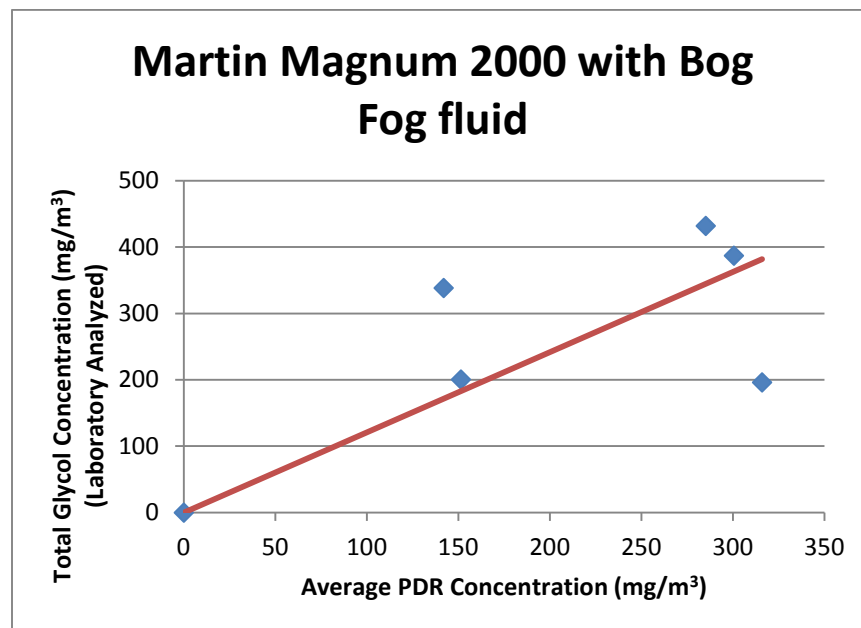
ENVIRON developed calibration factors and Time-and-Distance guidelines for the use of Froggy's Fog Bog Fog fluid in a Martin Magnum 2000 fog generator.

Bog Fog is a glycol-based fog fluid. Calibration factors were developed to allow a Thermo Scientific PDR-1000 aerosol monitor to be used to measure concentrations glycols in the air after being released from the Magnum 2000.

The measured concentrations should be compared against the peak exposure guidance level for glycols, which is 40 mg/m<sup>3</sup>.



The calibration curve for glycols is shown below:



**Figure 1.** Calibration curve for Martin Magnum 2000 with Bog Fog fluid, based on glycol laboratory data. Calibration factor, based on slope of curve, is 1.21 (mg/m<sup>3</sup> glycol) / (mg/m<sup>3</sup> aerosol).

<b>Summary of Calibration Factor</b>				
<b>Manufacturer</b>	<b>Machine</b>	<b>Fluid</b>	<b>Fluid Type</b>	<b>Calibration Factor</b>
Martin	Magnum 2000	Bog Fog	Glycol	1.21

**Time and Distance Guidelines.** For various distances from the cue release point, the following table provides the average time (in seconds) after the end of the cue release after which the glycol concentrations will have fallen below the guidance levels. Thus, in order to prevent peak exposures to actors, the blocking and choreography should be arranged such that actors are not situated within a particular distance from the front of the fog release point until the amount of time listed in this table has elapsed following the end of the cue. For example, if a production is using the Martin Magnum 2000/Bog Fog combination at maximum output with 15-second cue duration, an actor should not be situated within eight feet from the front of the cue release point until at least 80 seconds following the end of the cue release.

<b>Summary of Time-and-Distance Guidelines for Fog Generation Martin Magnum 2000 with Bog Fog Fluid</b>						
<b>Release Duration (secs)</b>	<b>Time (in sec) After Which Air Concentrations Are Below Guidance Level (40 mg/m<sup>3</sup>)</b>					
	<b>Machine Setting*</b>	<b>8 ft</b>	<b>12 ft</b>	<b>16 ft</b>	<b>20 ft</b>	<b>25 ft</b>
5	Max	80	60	60	60	60
15	Max	80	70	70	70	60
30 <sup>†</sup>	Max	140	140	70	70	60
5	Mid	60	60	60	40	0
15	Mid	60	60	60	40	0
30 <sup>†</sup>	Mid	60	60	60	40	0

\*No output at minimum setting

†Machine turned off 18 seconds into run

It should be reiterated that the Time-and-Distance Guidelines provided above are intended to allow a production to use the tested equipment and fluid combinations without conducting monitoring. However, these Guidelines may not be appropriate for all productions. Productions may want to use different configurations for positioning the machine (e.g., different heights), provide on-stage ventilation, or generate fog for a shorter or longer period of time. In addition, many productions may have other stage-specific conditions (e.g., on-stage activities and props that enhance dispersion) that would allow actors to be present in areas that are restricted under these Guidelines but which, in fact, do not exceed the guidance levels. In those cases, production-specific monitoring would be recommended to evaluate whether peak exposure may occur.



## Calibration Factor and Time-and-Distance Guidelines

### Martin Magnum 2000 with Velocity Fluid

Prepared for Froggy's Fog by ENVIRON International Corporation

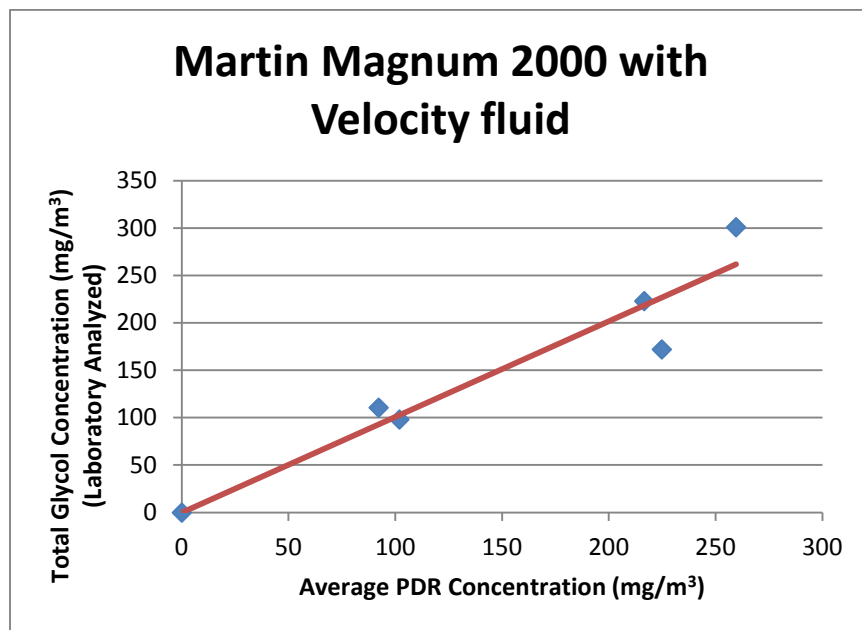
ENVIRON developed calibration factors and Time-and-Distance guidelines for the use of Froggy's Fog Velocity fluid in a Martin Magnum 2000 fog generator.

Velocity is a glycol-based fog fluid. Calibration factors were developed to allow a Thermo Scientific PDR-1000 aerosol monitor to be used to measure concentrations glycols in the air after being released from the Magnum 2000.

The measured concentrations should be compared against the peak exposure guidance level for glycols, which is 40 mg/m<sup>3</sup>.



The calibration curve for glycols is shown below:



**Figure 1.** Calibration curve for Martin Magnum 2000 with Velocity fluid, based on glycol laboratory data. Calibration factor, based on slope of curve, is 1.01 (mg/m<sup>3</sup> glycol) / (mg/m<sup>3</sup> aerosol).

Summary of Calibration Factor				
Manufacturer	Machine	Fluid	Fluid Type	Calibration Factor
Martin	Magnum 2000	Velocity	Glycol	1.01

**Time and Distance Guidelines.** For various distances from the cue release point, the following table provides the average time (in seconds) after the end of the cue release after which the glycol concentrations will have fallen below the guidance levels. Thus, in order to prevent peak exposures to actors, the blocking and choreography should be arranged such that actors are not situated within a particular distance from the front of the fog release point until the amount of time listed in this table has elapsed following the end of the cue. For example, if a production is using the Martin Magnum 2000/Velocity combination at maximum output with 30-second cue duration, an actor should not be situated within five to 15 feet from the front of the cue release point until at least 20 seconds following the end of the cue release.

Summary of Time-and-Distance Guidelines for Fog Generation Martin Magnum 2000 with Velocity Fluid						
Release Duration (secs)	Time (in sec) After Which Air Concentrations Are Below Guidance Level (40 mg/m <sup>3</sup> )					
	Machine Setting*	5 ft	10 ft	15 ft	20 ft	25 ft
30	Max	20	20	20	0	0
60†	Max	20	20	20	10	10
120†	Max	30	30	30	10	10
30†	Mid	20	20	20	0	0
60†	Mid	20	20	20	0	0
120†	Mid	20	20	20	0	0

\*No output at minimum setting

†Machine turned on and off after 20 seconds

It should be reiterated that the Time-and-Distance Guidelines provided above are intended to allow a production to use the tested equipment and fluid combinations without conducting monitoring. However, these Guidelines may not be appropriate for all productions. Productions may want to use different configurations for positioning the machine (e.g., different heights), provide on-stage ventilation, or generate fog for a shorter or longer period of time. In addition, many productions may have other stage-specific conditions (e.g., on-stage activities and props that enhance dispersion) that would allow actors to be present in areas that are restricted under these Guidelines but which, in fact, do not exceed the guidance levels. In those cases, production-specific monitoring would be recommended to evaluate whether peak exposure may occur.



## Calibration Factor and Time-and-Distance Guidelines

### Martin Magnum 2000 with Cryo Freeze Fluid

Prepared for Froggy's Fog by ENVIRON International Corporation

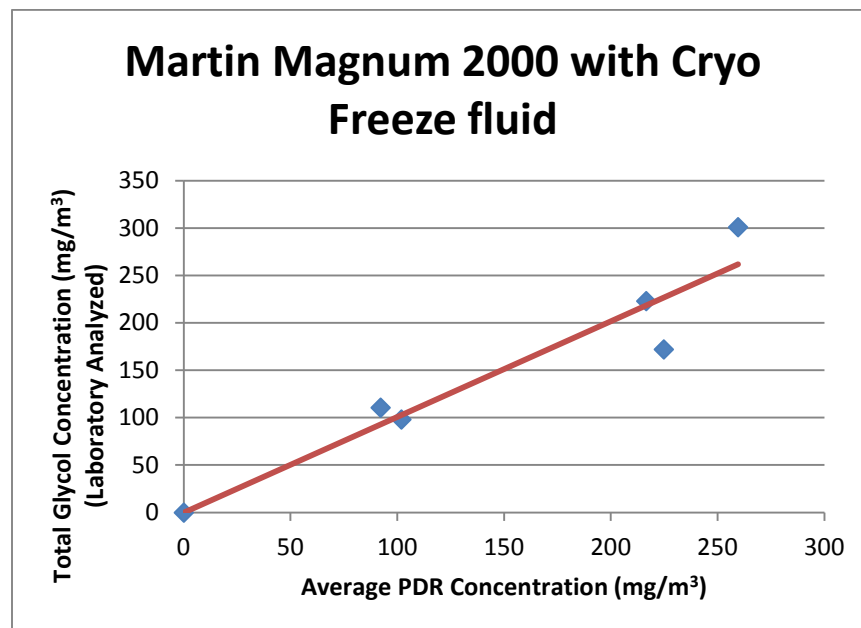
ENVIRON developed calibration factors and Time-and-Distance guidelines for the use of Froggy's Fog Cryo Freeze fluid in a Martin Magnum 2000 fog generator.

Cryo Freeze is a glycol-based fog fluid. Calibration factors were developed to allow a Thermo Scientific PDR-1000 aerosol monitor to be used to measure concentrations glycols in the air after being released from the Magnum 2000.

The measured concentrations should be compared against the peak exposure guidance level for glycols, which is 40 mg/m<sup>3</sup>.



The calibration curve for glycols is shown below:



**Figure 1.** Calibration curve for Martin Magnum 2000 with Cryo Freeze fluid, based on glycol laboratory data. Calibration factor, based on slope of curve, is 1.01 (mg/m<sup>3</sup> glycol) / (mg/m<sup>3</sup> aerosol).

Summary of Calibration Factor				
Manufacturer	Machine	Fluid	Fluid Type	Calibration Factor
Martin	Magnum 2000	Cryo Freeze	Glycol	1.01

**Time and Distance Guidelines.** For various distances from the cue release point, the following table provides the average time (in seconds) after the end of the cue release after which the glycol concentrations will have fallen below the guidance levels. Thus, in order to prevent peak exposures to actors, the blocking and choreography should be arranged such that actors are not situated within a particular distance from the front of the fog release point until the amount of time listed in this table has elapsed following the end of the cue. For example, if a production is using the Martin Magnum 2000/Cryo Freeze combination at maximum output with 30-second cue duration, an actor should not be situated within five to 15 feet from the front of the cue release point until at least 20 seconds following the end of the cue release.

Summary of Time-and-Distance Guidelines for Fog Generation Martin Magnum 2000 with Cryo Freeze Fluid						
Release Duration (secs)	Time (in sec) After Which Air Concentrations Are Below Guidance Level (40 mg/m <sup>3</sup> )					
	Machine Setting*	5 ft	10 ft	15 ft	20 ft	25 ft
30	Max	20	20	20	0	0
60†	Max	20	20	20	10	10
120†	Max	30	30	30	10	10
30†	Mid	20	20	20	0	0
60†	Mid	20	20	20	0	0
120†	Mid	20	20	20	0	0

\*No output at minimum setting

†Machine turned on and off after 20 seconds

It should be reiterated that the Time-and-Distance Guidelines provided above are intended to allow a production to use the tested equipment and fluid combinations without conducting monitoring. However, these Guidelines may not be appropriate for all productions. Productions may want to use different configurations for positioning the machine (e.g., different heights), provide on-stage ventilation, or generate fog for a shorter or longer period of time. In addition, many productions may have other stage-specific conditions (e.g., on-stage activities and props that enhance dispersion) that would allow actors to be present in areas that are restricted under these Guidelines but which, in fact, do not exceed the guidance levels. In those cases, production-specific monitoring would be recommended to evaluate whether peak exposure may occur.



## Calibration Factor and Time-and-Distance Guidelines

### Martin Magnum 2000 with Quick Blast Fluid

Prepared for Froggy's Fog by ENVIRON International Corporation

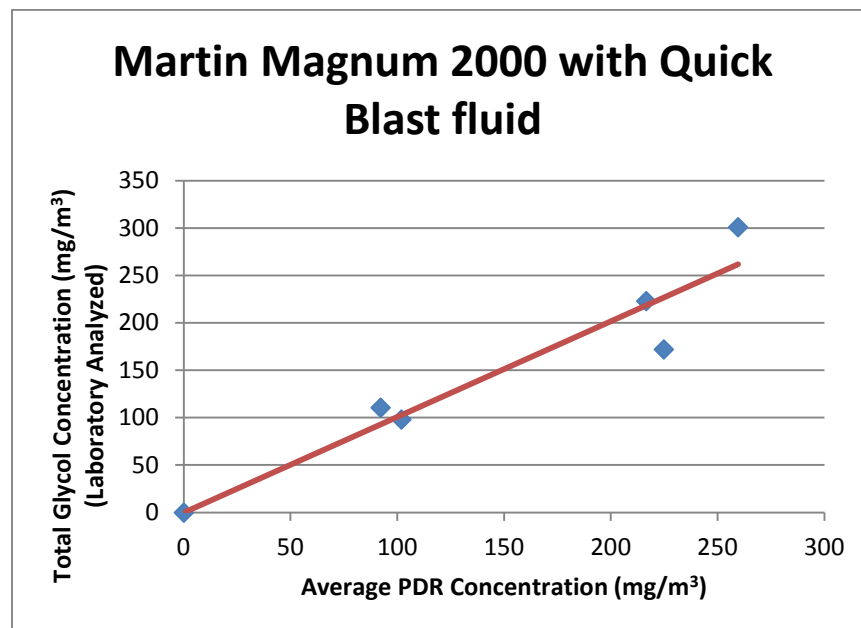
ENVIRON developed calibration factors and Time-and-Distance guidelines for the use of Froggy's Fog Quick Blast fluid in a Martin Magnum 2000 fog generator.

Quick Blast is a glycol-based fog fluid. Calibration factors were developed to allow a Thermo Scientific PDR-1000 aerosol monitor to be used to measure concentrations glycols in the air after being released from the Magnum 2000.

The measured concentrations should be compared against the peak exposure guidance level for glycols, which is 40 mg/m<sup>3</sup>.



The calibration curve for glycols is shown below:



**Figure 1.** Calibration curve for Martin Magnum 2000 with Quick Blast fluid, based on glycol laboratory data. Calibration factor, based on slope of curve, is 1.01 (mg/m<sup>3</sup> glycol) / (mg/m<sup>3</sup> aerosol).

Summary of Calibration Factor				
Manufacturer	Machine	Fluid	Fluid Type	Calibration Factor
Martin	Magnum 2000	Quick Blast	Glycol	1.01

**Time and Distance Guidelines.** For various distances from the cue release point, the following table provides the average time (in seconds) after the end of the cue release after which the glycol concentrations will have fallen below the guidance levels. Thus, in order to prevent peak exposures to actors, the blocking and choreography should be arranged such that actors are not situated within a particular distance from the front of the fog release point until the amount of time listed in this table has elapsed following the end of the cue. For example, if a production is using the Martin Magnum 2000/Quick Blast combination at maximum output with 30-second cue duration, an actor should not be situated within five to 15 feet from the front of the cue release point until at least 20 seconds following the end of the cue release.

Summary of Time-and-Distance Guidelines for Fog Generation Martin Magnum 2000 with Quick Blast Fluid						
Release Duration (secs)	Time (in sec) After Which Air Concentrations Are Below Guidance Level (40 mg/m <sup>3</sup> )					
	Machine Setting*	5 ft	10 ft	15 ft	20 ft	25 ft
30	Max	20	20	20	0	0
60†	Max	20	20	20	10	10
120†	Max	30	30	30	10	10
30†	Mid	20	20	20	0	0
60†	Mid	20	20	20	0	0
120†	Mid	20	20	20	0	0

\*No output at minimum setting

†Machine turned on and off after 20 seconds

It should be reiterated that the Time-and-Distance Guidelines provided above are intended to allow a production to use the tested equipment and fluid combinations without conducting monitoring. However, these Guidelines may not be appropriate for all productions. Productions may want to use different configurations for positioning the machine (e.g., different heights), provide on-stage ventilation, or generate fog for a shorter or longer period of time. In addition, many productions may have other stage-specific conditions (e.g., on-stage activities and props that enhance dispersion) that would allow actors to be present in areas that are restricted under these Guidelines but which, in fact, do not exceed the guidance levels. In those cases, production-specific monitoring would be recommended to evaluate whether peak exposure may occur.





# Calibration Factor and Time-and-Distance Guidelines

## Martin ZR-33 with Velocity Fluid

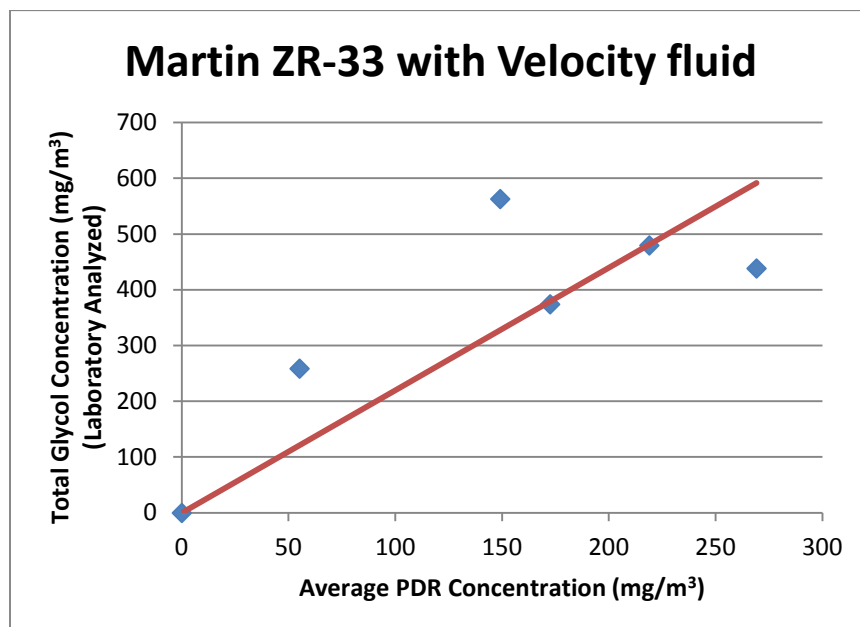
Prepared for Froggy's Fog by ENVIRON International Corporation

ENVIRON developed calibration factors and Time-and-Distance guidelines for the use of Froggy's Fog Velocity fluid in a Martin ZR-33 fog generator.

Velocity is a glycol-based fog fluid. Calibration factors were developed to allow a Thermo Scientific PDR-1000 aerosol monitor to be used to measure concentrations glycols in the air after being released from the ZR-33.

The measured concentrations should be compared against the peak exposure guidance level for glycols, which is 40 mg/m<sup>3</sup>.

The calibration curve for glycols is shown below:



**Figure 1.** Calibration curve for Martin ZR-33 with Velocity fluid, based on glycol laboratory data. Calibration factor, based on slope of curve, is 2.20 (mg/m<sup>3</sup> glycol) / (mg/m<sup>3</sup> aerosol).

Summary of Calibration Factor				
Manufacturer	Machine	Fluid	Fluid Type	Calibration Factor
Martin	ZR-33	Velocity	Glycol	2.20

**Time and Distance Guidelines.** For various distances from the cue release point, the following table provides the average time (in seconds) after the end of the cue release after which the glycol concentrations will have fallen below the guidance levels. Thus, in order to prevent peak exposures to actors, the blocking and choreography should be arranged such that actors are not situated within a particular distance from the front of the fog release point until the amount of time listed in this table has elapsed following the end of the cue. For example, if a production is using the Martin ZR-33/Velocity combination at an output setting of 10 with 30-second cue duration, an actor should not be situated within five to 10 feet from the front of the cue release point until at least 20 seconds following the end of the cue release.

Summary of Time-and-Distance Guidelines for Fog Generation Martin ZR-33 with Velocity Fluid						
Release Duration (secs)	Output Setting	Time (in sec) After Which Air Concentrations Are Below Guidance Level (40 mg/m <sup>3</sup> )				
		5 ft	10 ft	15 ft	20 ft	25 ft
5	10	20	20	0	0	0
15	10	20	20	10	0	0
30	10	20	20	10	0	0
30	6.5	20	10	0	0	0
60*	6.5	20	10	0	0	0
120*	6.5	20	20	0	0	0
60*	2.5	10	0	0	0	0
120*	2.5	20	20	0	0	0

\*Machine ran at reduced output after 30 seconds

It should be reiterated that the Time-and-Distance Guidelines provided above are intended to allow a production to use the tested equipment and fluid combinations without conducting monitoring. However, these Guidelines may not be appropriate for all productions. Productions may want to use different configurations for positioning the machine (e.g., different heights), provide on-stage ventilation, or generate fog for a shorter or longer period of time. In addition, many productions may have other stage-specific conditions (e.g., on-stage activities and props that enhance dispersion) that would allow actors to be present in areas that are restricted under these Guidelines but which, in fact, do not exceed the guidance levels. In those cases, production-specific monitoring would be recommended to evaluate whether peak exposure may occur.



# Calibration Factor and Time-and-Distance Guidelines

## Martin ZR-33 with Cryo Freeze Fluid

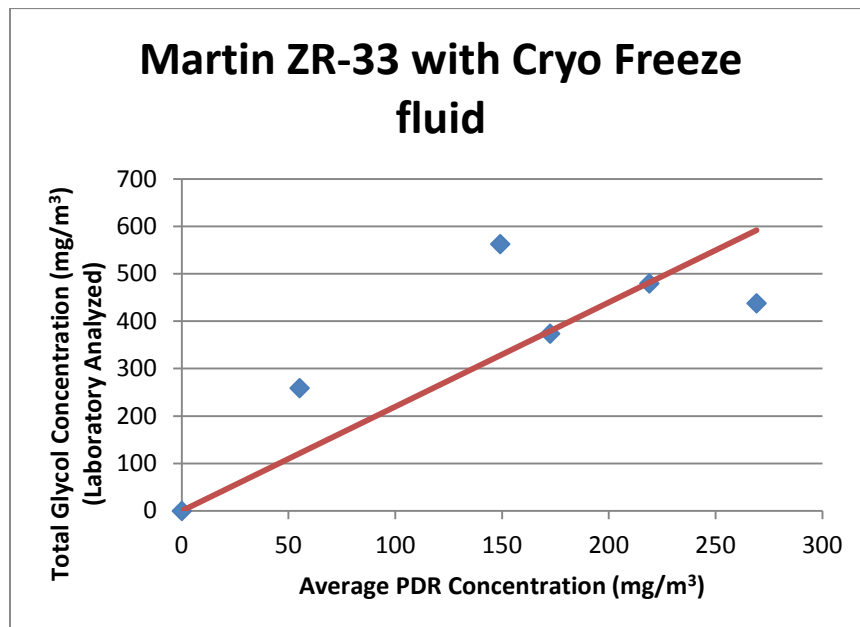
Prepared for Froggy's Fog by ENVIRON International Corporation

ENVIRON developed calibration factors and Time-and-Distance guidelines for the use of Froggy's Fog Cryo Freeze fluid in a Martin ZR-33 fog generator.

Cryo Freeze is a glycol-based fog fluid. Calibration factors were developed to allow a Thermo Scientific PDR-1000 aerosol monitor to be used to measure concentrations glycols in the air after being released from the ZR-33.

The measured concentrations should be compared against the peak exposure guidance level for glycols, which is 40 mg/m<sup>3</sup>.

The calibration curve for glycols is shown below:



**Figure 1.** Calibration curve for Martin ZR-33 with Cryo Freeze fluid, based on glycol laboratory data. Calibration factor, based on slope of curve, is 2.20 (mg/m<sup>3</sup> glycol) / (mg/m<sup>3</sup> aerosol).

Summary of Calibration Factor				
Manufacturer	Machine	Fluid	Fluid Type	Calibration Factor
Martin	ZR-33	Cryo Freeze	Glycol	2.20

**Time and Distance Guidelines.** For various distances from the cue release point, the following table provides the average time (in seconds) after the end of the cue release after which the glycol concentrations will have fallen below the guidance levels. Thus, in order to prevent peak exposures to actors, the blocking and choreography should be arranged such that actors are not situated within a particular distance from the front of the fog release point until the amount of time listed in this table has elapsed following the end of the cue. For example, if a production is using the Martin ZR-33/Cryo Freeze combination at an output setting of 10 with 30-second cue duration, an actor should not be situated within five to 10 feet from the front of the cue release point until at least 20 seconds following the end of the cue release.

Summary of Time-and-Distance Guidelines for Fog Generation Martin ZR-33 with Cryo Freeze Fluid						
Release Duration (secs)	Output Setting	Time (in sec) After Which Air Concentrations Are Below Guidance Level (40 mg/m <sup>3</sup> )				
		5 ft	10 ft	15 ft	20 ft	25 ft
5	10	20	20	0	0	0
15	10	20	20	10	0	0
30	10	20	20	10	0	0
30	6.5	20	10	0	0	0
60*	6.5	20	10	0	0	0
120*	6.5	20	20	0	0	0
60*	2.5	10	0	0	0	0
120*	2.5	20	20	0	0	0

\*Machine ran at reduced output after 30 seconds

It should be reiterated that the Time-and-Distance Guidelines provided above are intended to allow a production to use the tested equipment and fluid combinations without conducting monitoring. However, these Guidelines may not be appropriate for all productions. Productions may want to use different configurations for positioning the machine (e.g., different heights), provide on-stage ventilation, or generate fog for a shorter or longer period of time. In addition, many productions may have other stage-specific conditions (e.g., on-stage activities and props that enhance dispersion) that would allow actors to be present in areas that are restricted under these Guidelines but which, in fact, do not exceed the guidance levels. In those cases, production-specific monitoring would be recommended to evaluate whether peak exposure may occur.



# Calibration Factor and Time-and-Distance Guidelines

## Martin ZR-33 with Quick Blast Fluid

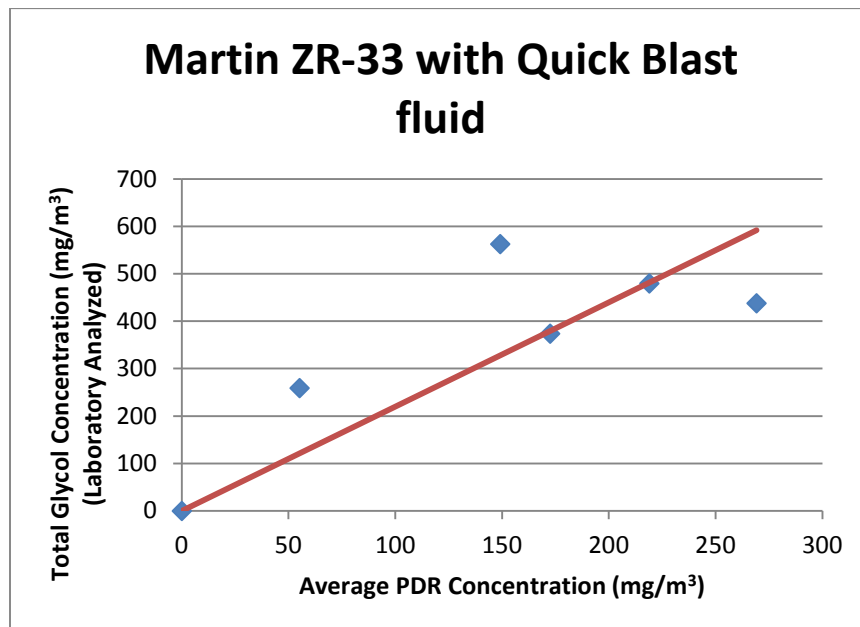
Prepared for Froggy's Fog by ENVIRON International Corporation

ENVIRON developed calibration factors and Time-and-Distance guidelines for the use of Froggy's Fog Quick Blast fluid in a Martin ZR-33 fog generator.

Quick Blast is a glycol-based fog fluid. Calibration factors were developed to allow a Thermo Scientific PDR-1000 aerosol monitor to be used to measure concentrations glycols in the air after being released from the ZR-33.

The measured concentrations should be compared against the peak exposure guidance level for glycols, which is 40 mg/m<sup>3</sup>.

The calibration curve for glycols is shown below:



**Figure 1.** Calibration curve for Martin ZR-33 with Quick Blast fluid, based on glycol laboratory data. Calibration factor, based on slope of curve, is 2.20 (mg/m<sup>3</sup> glycol) / (mg/m<sup>3</sup> aerosol).

Summary of Calibration Factor				
Manufacturer	Machine	Fluid	Fluid Type	Calibration Factor
Martin	ZR-33	Quick Blast	Glycol	2.20

**Time and Distance Guidelines.** For various distances from the cue release point, the following table provides the average time (in seconds) after the end of the cue release after which the glycol concentrations will have fallen below the guidance levels. Thus, in order to prevent peak exposures to actors, the blocking and choreography should be arranged such that actors are not situated within a particular distance from the front of the fog release point until the amount of time listed in this table has elapsed following the end of the cue. For example, if a production is using the Martin ZR-33/Quick Blast combination at an output setting of 10 with 30-second cue duration, an actor should not be situated within five to 10 feet from the front of the cue release point until at least 20 seconds following the end of the cue release.

Summary of Time-and-Distance Guidelines for Fog Generation Martin ZR-33 with Quick Blast Fluid						
Release Duration (secs)	Output Setting	Time (in sec) After Which Air Concentrations Are Below Guidance Level (40 mg/m <sup>3</sup> )				
		5 ft	10 ft	15 ft	20 ft	25 ft
5	10	20	20	0	0	0
15	10	20	20	10	0	0
30	10	20	20	10	0	0
30	6.5	20	10	0	0	0
60*	6.5	20	10	0	0	0
120*	6.5	20	20	0	0	0
60*	2.5	10	0	0	0	0
120*	2.5	20	20	0	0	0

\*Machine ran at reduced output after 30 seconds

It should be reiterated that the Time-and-Distance Guidelines provided above are intended to allow a production to use the tested equipment and fluid combinations without conducting monitoring. However, these Guidelines may not be appropriate for all productions. Productions may want to use different configurations for positioning the machine (e.g., different heights), provide on-stage ventilation, or generate fog for a shorter or longer period of time. In addition, many productions may have other stage-specific conditions (e.g., on-stage activities and props that enhance dispersion) that would allow actors to be present in areas that are restricted under these Guidelines but which, in fact, do not exceed the guidance levels. In those cases, production-specific monitoring would be recommended to evaluate whether peak exposure may occur.



# Calibration Factor and Time-and-Distance Guidelines

## Martin ZR-44 with Backwood Bay Fluid

Prepared for Froggy's Fog by ENVIRON International Corporation

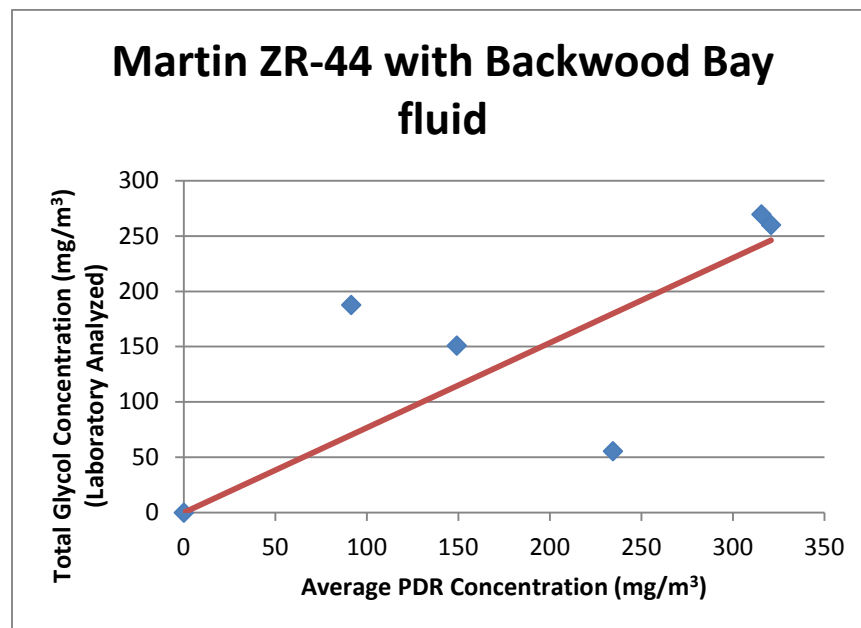
ENVIRON developed calibration factors and Time-and-Distance guidelines for the use of Froggy's Fog Backwood Bay fluid in a Martin ZR-44 fog generator.

Backwood Bay is a glycol-based fog fluid. Calibration factors were developed to allow a Thermo Scientific PDR-1000 aerosol monitor to be used to measure concentrations glycols in the air after being released from the ZR-44.

The measured concentrations should be compared against the peak exposure guidance level for glycols, which is 40 mg/m<sup>3</sup>.



The calibration curve for glycols is shown below:



**Figure 1.** Calibration curve for Martin ZR-44 with Backwood Bay fluid, based on glycol laboratory data. Calibration factor, based on slope of curve, is 0.77 (mg/m<sup>3</sup> glycol) / (mg/m<sup>3</sup> aerosol).

Summary of Calibration Factor				
Manufacturer	Machine	Fluid	Fluid Type	Calibration Factor
Martin	ZR-44	Backwood Bay	Glycol	0.77

**Time and Distance Guidelines.** For various distances from the cue release point, the following table provides the average time (in seconds) after the end of the cue release after which the glycol concentrations will have fallen below the guidance levels. Thus, in order to prevent peak exposures to actors, the blocking and choreography should be arranged such that actors are not situated within a particular distance from the front of the fog release point until the amount of time listed in this table has elapsed following the end of the cue. For example, if a production is using the Martin ZR-44/Backwood Bay combination at an output setting of 10 with 15-second cue duration, an actor should not be situated within eight feet from the front of the cue release point until at least 50 seconds following the end of the cue release.

Summary of Time-and-Distance Guidelines for Fog Generation Martin ZR-44 with Backwood Bay Fluid						
Release Duration (secs)	Output Setting	Time (in sec) After Which Air Concentrations Are Below Guidance Level (40 mg/m <sup>3</sup> )				
		8 ft	12 ft	16 ft	20 ft	25 ft
5	10	50	30	30	0	0
15	10	50	40	30	20	30
30	10	60	60	60	40	40
30	7	60	60	60	40	40
60	7	60	60	60	40	40
120*	7	110	60	60	40	40
60	3	30	10	0	0	0
120	3	110	20	0	0	0

\*Machine had reduced output volume after 75 seconds

It should be reiterated that the Time-and-Distance Guidelines provided above are intended to allow a production to use the tested equipment and fluid combinations without conducting monitoring. However, these Guidelines may not be appropriate for all productions. Productions may want to use different configurations for positioning the machine (e.g., different heights), provide on-stage ventilation, or generate fog for a shorter or longer period of time. In addition, many productions may have other stage-specific conditions (e.g., on-stage activities and props that enhance dispersion) that would allow actors to be present in areas that are restricted under these Guidelines but which, in fact, do not exceed the guidance levels. In those cases, production-specific monitoring would be recommended to evaluate whether peak exposure may occur.





# Calibration Factor and Time-and-Distance Guidelines

## Martin ZR-44 with Bog Fog Fluid

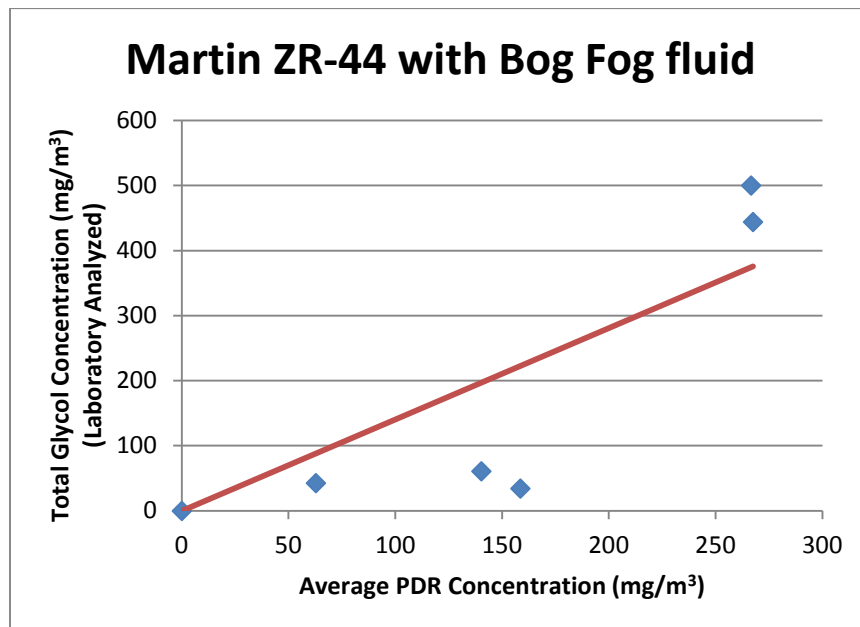
Prepared for Froggy's Fog by ENVIRON International Corporation

ENVIRON developed calibration factors and Time-and-Distance guidelines for the use of Froggy's Fog Bog Fog fluid in a Martin ZR-44 fog generator.

Bog Fog is a glycol-based fog fluid. Calibration factors were developed to allow a Thermo Scientific PDR-1000 aerosol monitor to be used to measure concentrations glycols in the air after being released from the ZR-44.

The measured concentrations should be compared against the peak exposure guidance level for glycols, which is 40 mg/m<sup>3</sup>.

The calibration curve for glycols is shown below:



**Figure 1.** Calibration curve for Martin ZR-44 with Bog Fog fluid, based on glycol laboratory data. Calibration factor, based on slope of curve, is 1.40 (mg/m<sup>3</sup> glycol) / (mg/m<sup>3</sup> aerosol).

Summary of Calibration Factor				
Manufacturer	Machine	Fluid	Fluid Type	Calibration Factor
Martin	ZR-44	Bog Fog	Glycol	1.40

**Time and Distance Guidelines.** For various distances from the cue release point, the following table provides the average time (in seconds) after the end of the cue release after which the glycol concentrations will have fallen below the guidance levels. Thus, in order to prevent peak exposures to actors, the blocking and choreography should be arranged such that actors are not situated within a particular distance from the front of the fog release point until the amount of time listed in this table has elapsed following the end of the cue. For example, if a production is using the Martin ZR-44/Bog Fog combination at an output setting of 10 with 15-second cue duration, an actor should not be situated within eight to 12 feet from the front of the cue release point until at least 50 seconds following the end of the cue release.

Summary of Time-and-Distance Guidelines for Fog Generation Martin ZR-44 with Bog Fog Fluid						
Release Duration (secs)	Output Setting	Time (in sec) After Which Air Concentrations Are Below Guidance Level (40 mg/m <sup>3</sup> )				
		8 ft	12 ft	16 ft	20 ft	25 ft
5	10	30	30	20	0	0
15	10	50	50	20	20	0
30	10	60	60	40	30	20
30	7	50	50	40	30	20
60*	7	50	50	40	30	20
120*	7	60	50	40	30	20
60	3	50	50	30	0	0
120	3	60	50	30	0	0

\*Machine had reduced output volume after 45 seconds

It should be reiterated that the Time-and-Distance Guidelines provided above are intended to allow a production to use the tested equipment and fluid combinations without conducting monitoring. However, these Guidelines may not be appropriate for all productions. Productions may want to use different configurations for positioning the machine (e.g., different heights), provide on-stage ventilation, or generate fog for a shorter or longer period of time. In addition, many productions may have other stage-specific conditions (e.g., on-stage activities and props that enhance dispersion) that would allow actors to be present in areas that are restricted under these Guidelines but which, in fact, do not exceed the guidance levels. In those cases, production-specific monitoring would be recommended to evaluate whether peak exposure may occur.



# Calibration Factor and Time-and-Distance Guidelines

## Martin ZR-44 with Velocity Fluid

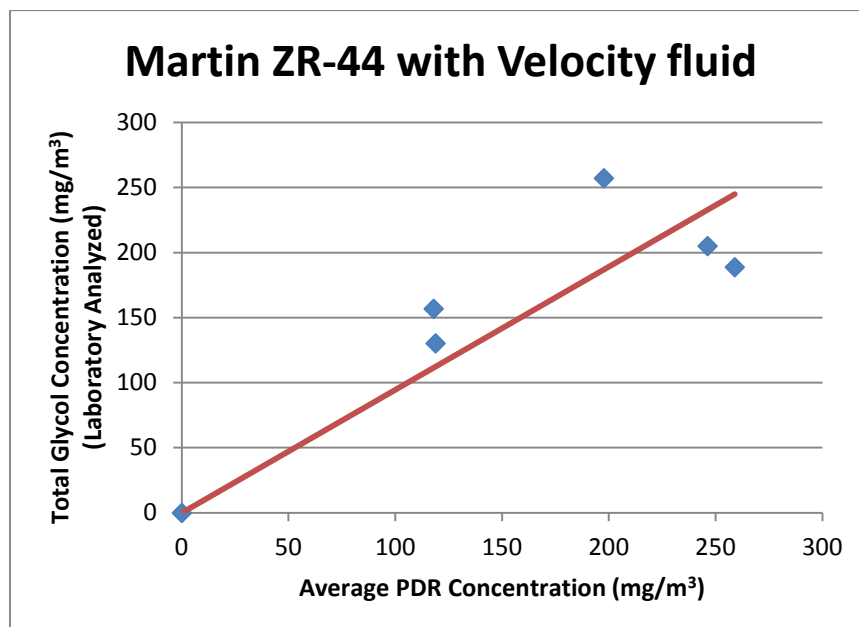
Prepared for Froggy's Fog by ENVIRON International Corporation

ENVIRON developed calibration factors and Time-and-Distance guidelines for the use of Froggy's Fog Velocity fluid in a Martin ZR-44 fog generator.

Velocity is a glycol-based fog fluid. Calibration factors were developed to allow a Thermo Scientific PDR-1000 aerosol monitor to be used to measure concentrations glycols in the air after being released from the ZR-44.

The measured concentrations should be compared against the peak exposure guidance level for glycols, which is 40 mg/m<sup>3</sup>.

The calibration curve for glycols is shown below:



**Figure 1.** Calibration curve for Martin ZR-44 with Velocity fluid, based on glycol laboratory data. Calibration factor, based on slope of curve, is 0.95 (mg/m<sup>3</sup> glycol) / (mg/m<sup>3</sup> aerosol).

Summary of Calibration Factor				
Manufacturer	Machine	Fluid	Fluid Type	Calibration Factor
Martin	ZR-44	Velocity	Glycol	0.95

**Time and Distance Guidelines.** For various distances from the cue release point, the following table provides the average time (in seconds) after the end of the cue release after which the glycol concentrations will have fallen below the guidance levels. Thus, in order to prevent peak exposures to actors, the blocking and choreography should be arranged such that actors are not situated within a particular distance from the front of the fog release point until the amount of time listed in this table has elapsed following the end of the cue. For example, if a production is using the Martin ZR-44/Velocity combination at an output setting of 10 with 30-second cue duration, an actor should not be situated within five feet from the front of the cue release point until at least 20 seconds following the end of the cue release.

Summary of Time-and-Distance Guidelines for Fog Generation Martin ZR-44 with Velocity Fluid						
Release Duration (secs)	Output Setting	Time (in sec) After Which Air Concentrations Are Below Guidance Level (40 mg/m <sup>3</sup> )				
		5 ft	10 ft	15 ft	20 ft	25 ft
30	10	20	10	10	0	0
60*	10	20	10	10	0	0
120*	10	20	10	10	0	0
30	7	20	10	10	0	0
60	7	20	10	10	0	0
120†	7	20	10	10	0	0
60	3	10	0	0	0	0
120	3	10	0	0	0	0

\*Machine had reduced output volume after 45 seconds

†Machine output volume reduced gradually throughout run

It should be reiterated that the Time-and-Distance Guidelines provided above are intended to allow a production to use the tested equipment and fluid combinations without conducting monitoring. However, these Guidelines may not be appropriate for all productions. Productions may want to use different configurations for positioning the machine (e.g., different heights), provide on-stage ventilation, or generate fog for a shorter or longer period of time. In addition, many productions may have other stage-specific conditions (e.g., on-stage activities and props that enhance dispersion) that would allow actors to be present in areas that are restricted under these Guidelines but which, in fact, do not exceed the guidance levels. In those cases, production-specific monitoring would be recommended to evaluate whether peak exposure may occur.



## Calibration Factor and Time-and-Distance Guidelines

### Martin ZR-44 with Cryo Freeze Fluid

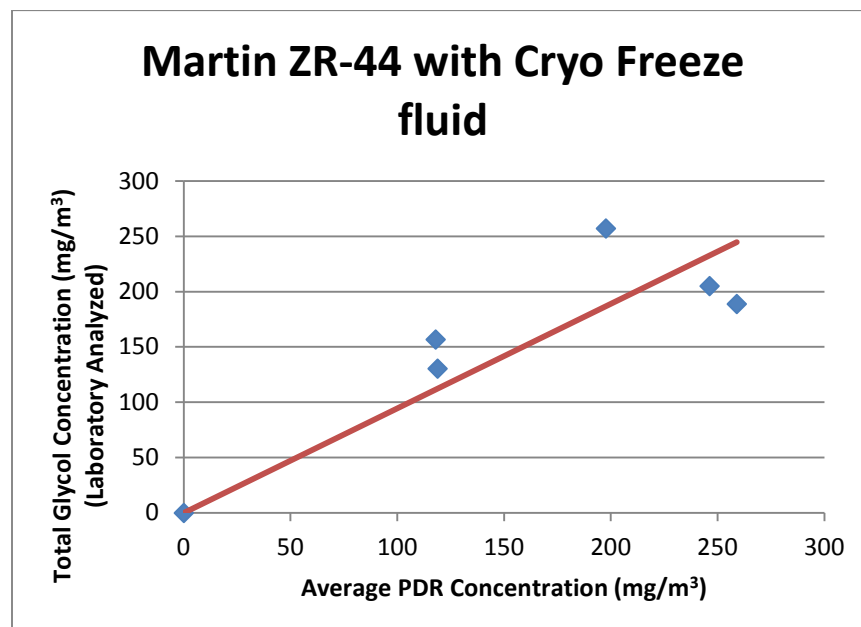
Prepared for Froggy's Fog by ENVIRON International Corporation

ENVIRON developed calibration factors and Time-and-Distance guidelines for the use of Froggy's Fog Cryo Freeze fluid in a Martin ZR-44 fog generator.

Cryo Freeze is a glycol-based fog fluid. Calibration factors were developed to allow a Thermo Scientific PDR-1000 aerosol monitor to be used to measure concentrations glycols in the air after being released from the ZR-44.

The measured concentrations should be compared against the peak exposure guidance level for glycols, which is 40 mg/m<sup>3</sup>.

The calibration curve for glycols is shown below:



**Figure 1.** Calibration curve for Martin ZR-44 with Cryo Freeze fluid, based on glycol laboratory data. Calibration factor, based on slope of curve, is 0.95 (mg/m<sup>3</sup> glycol) / (mg/m<sup>3</sup> aerosol).

Summary of Calibration Factor				
Manufacturer	Machine	Fluid	Fluid Type	Calibration Factor
Martin	ZR-44	Cryo Freeze	Glycol	0.95

**Time and Distance Guidelines.** For various distances from the cue release point, the following table provides the average time (in seconds) after the end of the cue release after which the glycol concentrations will have fallen below the guidance levels. Thus, in order to prevent peak exposures to actors, the blocking and choreography should be arranged such that actors are not situated within a particular distance from the front of the fog release point until the amount of time listed in this table has elapsed following the end of the cue. For example, if a production is using the Martin ZR-44/Cryo Freeze combination at an output setting of 10 with 30-second cue duration, an actor should not be situated within five feet from the front of the cue release point until at least 20 seconds following the end of the cue release.

Summary of Time-and-Distance Guidelines for Fog Generation Martin ZR-44 with Cryo Freeze Fluid						
Release Duration (secs)	Output Setting	Time (in sec) After Which Air Concentrations Are Below Guidance Level (40 mg/m <sup>3</sup> )				
		5 ft	10 ft	15 ft	20 ft	25 ft
30	10	20	10	10	0	0
60*	10	20	10	10	0	0
120*	10	20	10	10	0	0
30	7	20	10	10	0	0
60	7	20	10	10	0	0
120†	7	20	10	10	0	0
60	3	10	0	0	0	0
120	3	10	0	0	0	0

\*Machine had reduced output volume after 45 seconds

†Machine output volume reduced gradually throughout run

It should be reiterated that the Time-and-Distance Guidelines provided above are intended to allow a production to use the tested equipment and fluid combinations without conducting monitoring. However, these Guidelines may not be appropriate for all productions. Productions may want to use different configurations for positioning the machine (e.g., different heights), provide on-stage ventilation, or generate fog for a shorter or longer period of time. In addition, many productions may have other stage-specific conditions (e.g., on-stage activities and props that enhance dispersion) that would allow actors to be present in areas that are restricted under these Guidelines but which, in fact, do not exceed the guidance levels. In those cases, production-specific monitoring would be recommended to evaluate whether peak exposure may occur.



## Calibration Factor and Time-and-Distance Guidelines

### Martin ZR-44 with Quick Blast Fluid

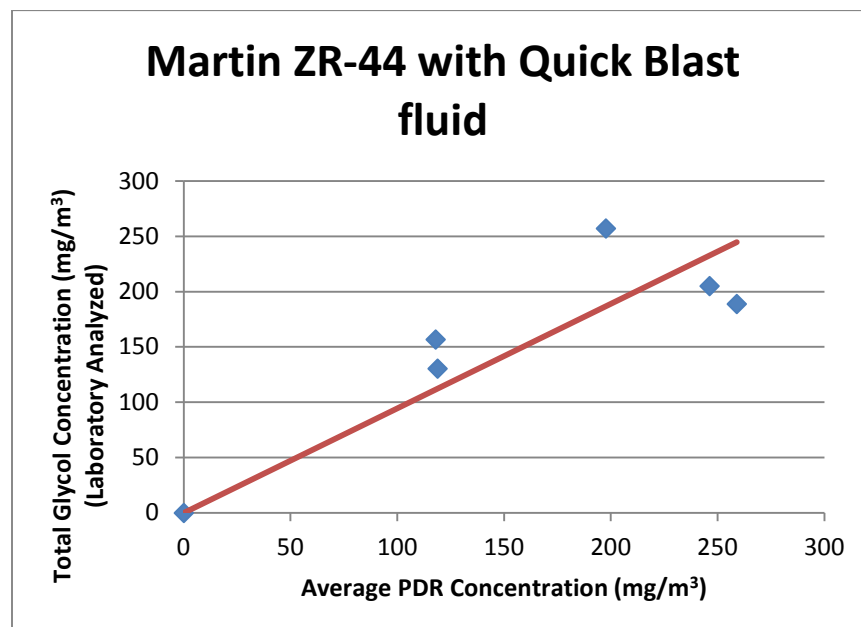
Prepared for Froggy's Fog by ENVIRON International Corporation

ENVIRON developed calibration factors and Time-and-Distance guidelines for the use of Froggy's Fog Quick Blast fluid in a Martin ZR-44 fog generator.

Quick Blast is a glycol-based fog fluid. Calibration factors were developed to allow a Thermo Scientific PDR-1000 aerosol monitor to be used to measure concentrations glycols in the air after being released from the ZR-44.

The measured concentrations should be compared against the peak exposure guidance level for glycols, which is 40 mg/m<sup>3</sup>.

The calibration curve for glycols is shown below:



**Figure 1.** Calibration curve for Martin ZR-44 with Quick Blast fluid, based on glycol laboratory data. Calibration factor, based on slope of curve, is 0.95 (mg/m<sup>3</sup> glycol) / (mg/m<sup>3</sup> aerosol).

Summary of Calibration Factor				
Manufacturer	Machine	Fluid	Fluid Type	Calibration Factor
Martin	ZR-44	Quick Blast	Glycol	0.95

**Time and Distance Guidelines.** For various distances from the cue release point, the following table provides the average time (in seconds) after the end of the cue release after which the glycol concentrations will have fallen below the guidance levels. Thus, in order to prevent peak exposures to actors, the blocking and choreography should be arranged such that actors are not situated within a particular distance from the front of the fog release point until the amount of time listed in this table has elapsed following the end of the cue. For example, if a production is using the Martin ZR-44/Quick Blast combination at an output setting of 10 with 30-second cue duration, an actor should not be situated within five feet from the front of the cue release point until at least 20 seconds following the end of the cue release.

Summary of Time-and-Distance Guidelines for Fog Generation Martin ZR-44 with Quick Blast Fluid						
Release Duration (secs)	Output Setting	Time (in sec) After Which Air Concentrations Are Below Guidance Level (40 mg/m <sup>3</sup> )				
		5 ft	10 ft	15 ft	20 ft	25 ft
30	10	20	10	10	0	0
60*	10	20	10	10	0	0
120*	10	20	10	10	0	0
30	7	20	10	10	0	0
60	7	20	10	10	0	0
120†	7	20	10	10	0	0
60	3	10	0	0	0	0
120	3	10	0	0	0	0

\*Machine had reduced output volume after 45 seconds

†Machine output volume reduced gradually throughout run

It should be reiterated that the Time-and-Distance Guidelines provided above are intended to allow a production to use the tested equipment and fluid combinations without conducting monitoring. However, these Guidelines may not be appropriate for all productions. Productions may want to use different configurations for positioning the machine (e.g., different heights), provide on-stage ventilation, or generate fog for a shorter or longer period of time. In addition, many productions may have other stage-specific conditions (e.g., on-stage activities and props that enhance dispersion) that would allow actors to be present in areas that are restricted under these Guidelines but which, in fact, do not exceed the guidance levels. In those cases, production-specific monitoring would be recommended to evaluate whether peak exposure may occur.





## Calibration Factor and Time-and-Distance Guidelines

### Reel EFX DF-50 Diffusion Hazer with DaFiddy Fluid – Oil Based Haze

Prepared for Froggy's Fog by ENVIRON International Corporation

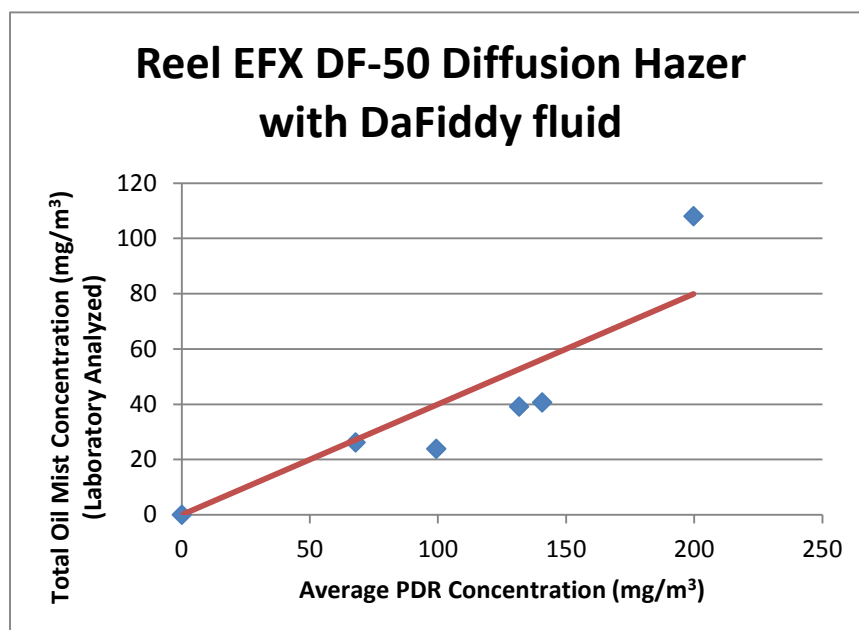
ENVIRON developed calibration factors and Time-and-Distance guidelines for the use of Froggy's Fog DaFiddy fluid in a Reel EFX DF-50 Diffusion Hazer haze generator.

DaFiddy is an oil-based fog fluid. Calibration factors were developed to allow a Thermo Scientific PDR-1000 aerosol monitor to be used to measure concentrations of oil mist in the air after being released from the DF-50 Diffusion Hazer.

The measured concentrations should be compared against the peak exposure guidance level for oil mist, which is 25 mg/m<sup>3</sup>.



The calibration curve for oil mist is shown below:



**Figure 1.** Calibration curve for Reel EFX DF-50 Diffusion Hazer with DaFiddy fluid, based on oil mist laboratory data. Calibration factor, based on slope of curve, is 0.40 (mg/m<sup>3</sup> oil mist) / (mg/m<sup>3</sup> aerosol).

Summary of Calibration Factor				
Manufacturer	Machine	Fluid	Fluid Type	Calibration Factor
Reel EFX	DF-50 Diffusion Hazer	DaFiddy	Oil	0.40

**Time and Distance Guidelines.** For various distances from the cue release point, the following table provides the average time (in seconds) after the end of the cue release after which the oil mist concentrations will have fallen below the guidance levels. Thus, in order to prevent peak exposures to actors, the blocking and choreography should be arranged such that actors are not situated within a particular distance from the front of the fog release point until the amount of time listed in this table has elapsed following the end of the cue. For example, if a production is using the Reel EFX DF-50 Diffusion Hazer/DaFiddy combination operating at full output with 60-second cue duration, an actor should not be situated within three to 5 feet from the front of the cue release point until at least 10 seconds following the end of the cue release.

Summary of Time-and-Distance Guidelines for Fog Generation Reel EFX DF-50 Diffusion Hazer with DaFiddy Fluid						
Release Duration (secs)	Output Setting	Time (in sec) After Which Air Concentrations Are Below Guidance Level (25 mg/m <sup>3</sup> )				
		3 ft	5 ft	7 ft	10 ft	15 ft
5	Full	10	0	0	0	0
15	Full	10	0	0	0	0
30	Full	10	10	0	0	0
60	Full	10	10	0	0	0
120	Full	10	10	0	0	0

It should be reiterated that the Time-and-Distance Guidelines provided above are intended to allow a production to use the tested equipment and fluid combinations without conducting monitoring. However, these Guidelines may not be appropriate for all productions. Productions may want to use different configurations for positioning the machine (e.g., different heights), provide on-stage ventilation, or generate fog for a shorter or longer period of time. In addition, many productions may have other stage-specific conditions (e.g., on-stage activities and props that enhance dispersion) that would allow actors to be present in areas that are restricted under these Guidelines but which, in fact, do not exceed the guidance levels. In those cases, production-specific monitoring would be recommended to evaluate whether peak exposure may occur.



## Calibration Factor and Time-and-Distance Guidelines

### Robe Fog 1550 FT with Backwood Bay Fluid

Prepared for Froggy's Fog by ENVIRON International Corporation

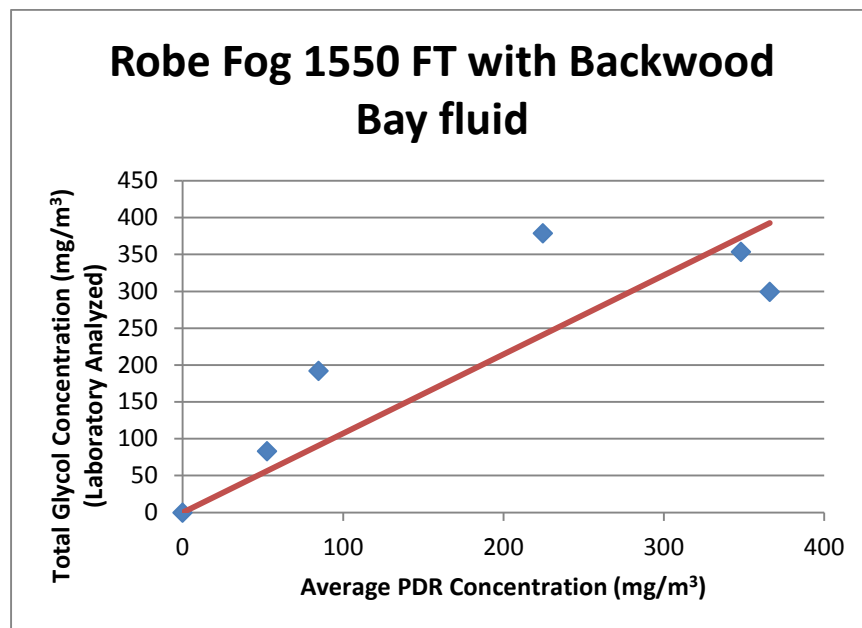
ENVIRON developed calibration factors and Time-and-Distance guidelines for the use of Froggy's Fog Backwood Bay fluid in a Robe Fog 1550 FT fog generator.

Backwood Bay is a glycol-based fog fluid. Calibration factors were developed to allow a Thermo Scientific PDR-1000 aerosol monitor to be used to measure concentrations glycols in the air after being released from the Fog 1550 FT.

The measured concentrations should be compared against the peak exposure guidance level for glycols, which is 40 mg/m<sup>3</sup>.



The calibration curve for glycols is shown below:



**Figure 1.** Calibration curve for Robe Fog 1550 FT with Backwood Bay fluid, based on glycol laboratory data. Calibration factor, based on slope of curve, is 1.07 (mg/m<sup>3</sup> glycol) / (mg/m<sup>3</sup> aerosol).

Summary of Calibration Factor				
Manufacturer	Machine	Fluid	Fluid Type	Calibration Factor
Robe	Fog 1550 FT	Backwood Bay	Glycol	1.07

**Time and Distance Guidelines.** For various distances from the cue release point, the following table provides the average time (in seconds) after the end of the cue release after which the glycol concentrations will have fallen below the guidance levels. Thus, in order to prevent peak exposures to actors, the blocking and choreography should be arranged such that actors are not situated within a particular distance from the front of the fog release point until the amount of time listed in this table has elapsed following the end of the cue. For example, if a production is using the Robe Fog 1550 FT/Backwood Bay combination at 100% output with 30-second cue duration, an actor should not be situated within five to 15 feet from the front of the cue release point until at least 70 seconds following the end of the cue release.

Summary of Time-and-Distance Guidelines for Fog Generation Robe Fog 1550 FT with Backwood Bay Fluid						
Release Duration (secs)	Time (in sec) After Which Air Concentrations Are Below Guidance Level (40 mg/m <sup>3</sup> )					
	Machine Setting	5 ft	10 ft	15 ft	20 ft	25 ft
5	100%	40	40	40	40	0
15	100%	70	70	70	50	40
30	100%	70	70	70	50	40
30	65%	50	40	40	40	0
60	65%	70	70	40	40	0
120*	65%	70	70	40	40	0
60	25%	60	50	30	0	0
120	25%	60	50	30	0	0

\*Machine ran at reduced output volume after 45 seconds, machine turned off for 37 seconds during run

It should be reiterated that the Time-and-Distance Guidelines provided above are intended to allow a production to use the tested equipment and fluid combinations without conducting monitoring. However, these Guidelines may not be appropriate for all productions. Productions may want to use different configurations for positioning the machine (e.g., different heights), provide on-stage ventilation, or generate fog for a shorter or longer period of time. In addition, many productions may have other stage-specific conditions (e.g., on-stage activities and props that enhance dispersion) that would allow actors to be present in areas that are restricted under these Guidelines but which, in fact, do not exceed the guidance levels. In those cases, production-specific monitoring would be recommended to evaluate whether peak exposure may occur.



## Calibration Factor and Time-and-Distance Guidelines

### Robe Fog 1550 FT with Amusement Park Fluid

Prepared for Froggy's Fog by ENVIRON International Corporation

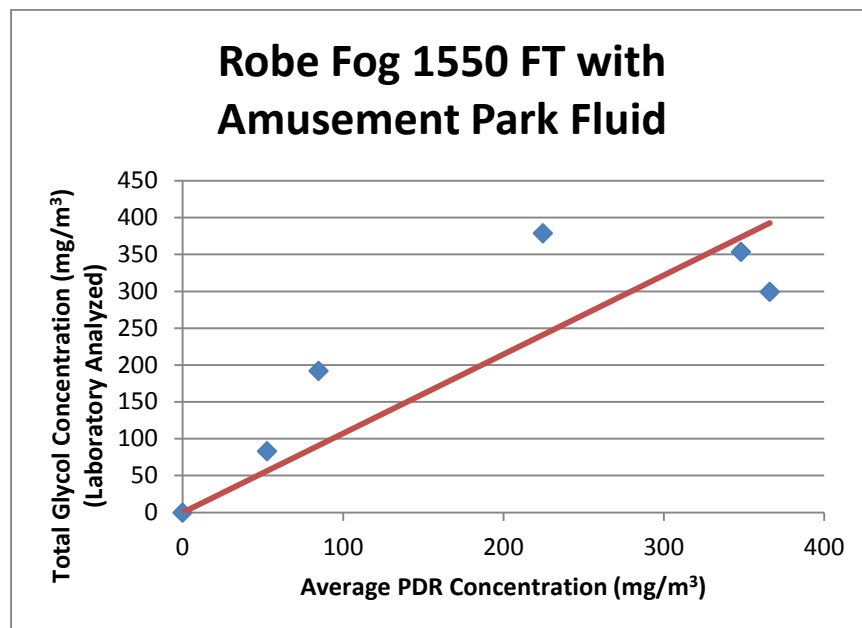
ENVIRON developed calibration factors and Time-and-Distance guidelines for the use of Froggy's Fog Amusement Park Fluid in a Robe Fog 1550 FT fog generator.

Amusement Park Fluid is a glycol-based fog fluid. Calibration factors were developed to allow a Thermo Scientific PDR-1000 aerosol monitor to be used to measure concentrations glycols in the air after being released from the Fog 1550 FT.

The measured concentrations should be compared against the peak exposure guidance level for glycols, which is  $40 \text{ mg/m}^3$ .



The calibration curve for glycols is shown below:



**Figure 1.** Calibration curve for Robe Fog 1550 FT with Amusement Park Fluid, based on glycol laboratory data. Calibration factor, based on slope of curve, is  $1.07 \text{ (mg/m}^3 \text{ glycol) / (mg/m}^3 \text{ aerosol)}$ .

<b>Summary of Calibration Factor</b>				
<b>Manufacturer</b>	<b>Machine</b>	<b>Fluid</b>	<b>Fluid Type</b>	<b>Calibration Factor</b>
Robe	Fog 1550 FT	Amusement Park Fluid	Glycol	1.07

**Time and Distance Guidelines.** For various distances from the cue release point, the following table provides the average time (in seconds) after the end of the cue release after which the glycol concentrations will have fallen below the guidance levels. Thus, in order to prevent peak exposures to actors, the blocking and choreography should be arranged such that actors are not situated within a particular distance from the front of the fog release point until the amount of time listed in this table has elapsed following the end of the cue. For example, if a production is using the Robe Fog 1550 FT/Amusement Park Fluid combination at 100% output with 30-second cue duration, an actor should not be situated within five to 15 feet from the front of the cue release point until at least 70 seconds following the end of the cue release.

<b>Summary of Time-and-Distance Guidelines for Fog Generation</b>						
<b>Robe Fog 1550 FT with Amusement Park Fluid</b>						
<b>Release Duration (secs)</b>	<b>Time (in sec) After Which Air Concentrations Are Below Guidance Level (40 mg/m<sup>3</sup>)</b>					
	<b>Machine Setting</b>	<b>5 ft</b>	<b>10 ft</b>	<b>15 ft</b>	<b>20 ft</b>	<b>25 ft</b>
5	100%	40	40	40	40	0
15	100%	70	70	70	50	40
30	100%	70	70	70	50	40
30	65%	50	40	40	40	0
60	65%	70	70	40	40	0
120*	65%	70	70	40	40	0
60	25%	60	50	30	0	0
120	25%	60	50	30	0	0

\*Machine ran at reduced output volume after 45 seconds, machine turned off for 37 seconds during run

It should be reiterated that the Time-and-Distance Guidelines provided above are intended to allow a production to use the tested equipment and fluid combinations without conducting monitoring. However, these Guidelines may not be appropriate for all productions. Productions may want to use different configurations for positioning the machine (e.g., different heights), provide on-stage ventilation, or generate fog for a shorter or longer period of time. In addition, many productions may have other stage-specific conditions (e.g., on-stage activities and props that enhance dispersion) that would allow actors to be present in areas that are restricted under these Guidelines but which, in fact, do not exceed the guidance levels. In those cases, production-specific monitoring would be recommended to evaluate whether peak exposure may occur.



## Calibration Factor and Time-and-Distance Guidelines

### Robe Fog 1550 FT with Bog Fog Fluid

Prepared for Froggy's Fog by ENVIRON International Corporation

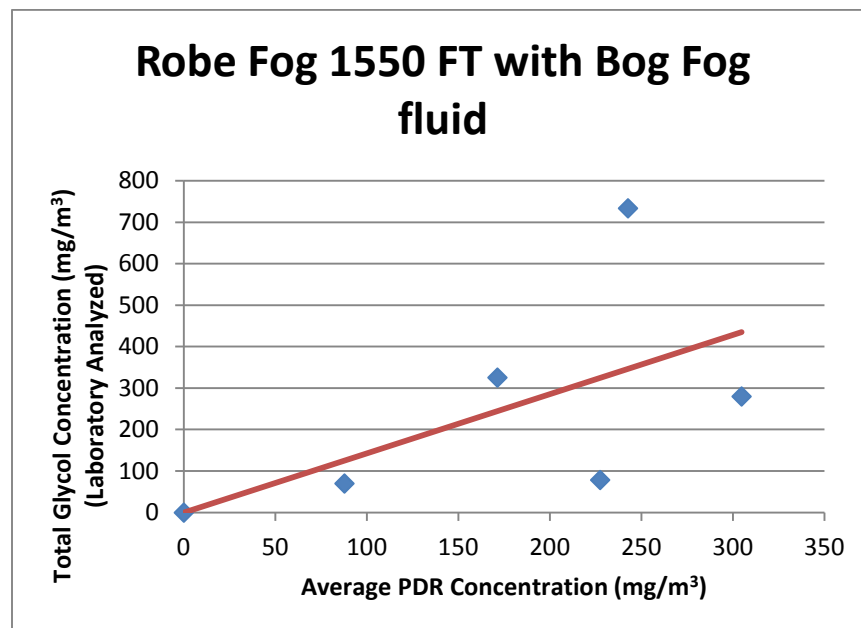
ENVIRON developed calibration factors and Time-and-Distance guidelines for the use of Froggy's Fog Bog Fog fluid in a Robe Fog 1550 FT fog generator.

Bog Fog is a glycol-based fog fluid. Calibration factors were developed to allow a Thermo Scientific PDR-1000 aerosol monitor to be used to measure concentrations glycols in the air after being released from the Fog 1550 FT.

The measured concentrations should be compared against the peak exposure guidance level for glycols, which is 40 mg/m<sup>3</sup>.



The calibration curve for glycols is shown below:



**Figure 1.** Calibration curve for Robe Fog 1550 FT with Bog Fog fluid, based on glycol laboratory data. Calibration factor, based on slope of curve, is 1.43 (mg/m<sup>3</sup> glycol) / (mg/m<sup>3</sup> aerosol).

Summary of Calibration Factor				
Manufacturer	Machine	Fluid	Fluid Type	Calibration Factor
Robe	Fog 1550 FT	Bog Fog	Glycol	1.43

**Time and Distance Guidelines.** For various distances from the cue release point, the following table provides the average time (in seconds) after the end of the cue release after which the glycol concentrations will have fallen below the guidance levels. Thus, in order to prevent peak exposures to actors, the blocking and choreography should be arranged such that actors are not situated within a particular distance from the front of the fog release point until the amount of time listed in this table has elapsed following the end of the cue. For example, if a production is using the Robe Fog 1550 FT/Bog Fog combination at 100% output with 30-second cue duration, an actor should not be situated within five to 10 feet from the front of the cue release point until at least 80 seconds following the end of the cue release.

Summary of Time-and-Distance Guidelines for Fog Generation Robe Fog 1550 FT with Bog Fog Fluid						
Release Duration (secs)	Time (in sec) After Which Air Concentrations Are Below Guidance Level (40 mg/m <sup>3</sup> )					
	Machine Setting	5 ft	10 ft	15 ft	20 ft	25 ft
5	100%	40	30	0	0	0
15	100%	50	30	0	0	0
30	100%	80	80	70	30	0
30	65%	80	60	50	0	0
60*	65%	80	60	50	30	10
120*	65%	80	60	50	30	10
60	25%	80	40	0	0	0
120†	25%	80	40	0	0	0

\*Machine runs at reduced output volume after 25 seconds

†Machine runs at reduced output volume after 4 seconds

It should be reiterated that the Time-and-Distance Guidelines provided above are intended to allow a production to use the tested equipment and fluid combinations without conducting monitoring. However, these Guidelines may not be appropriate for all productions. Productions may want to use different configurations for positioning the machine (e.g., different heights), provide on-stage ventilation, or generate fog for a shorter or longer period of time. In addition, many productions may have other stage-specific conditions (e.g., on-stage activities and props that enhance dispersion) that would allow actors to be present in areas that are restricted under these Guidelines but which, in fact, do not exceed the guidance levels. In those cases, production-specific monitoring would be recommended to evaluate whether peak exposure may occur.





## Calibration Factor and Time-and-Distance Guidelines

### Robe Fog 1550 FT with Velocity Fluid

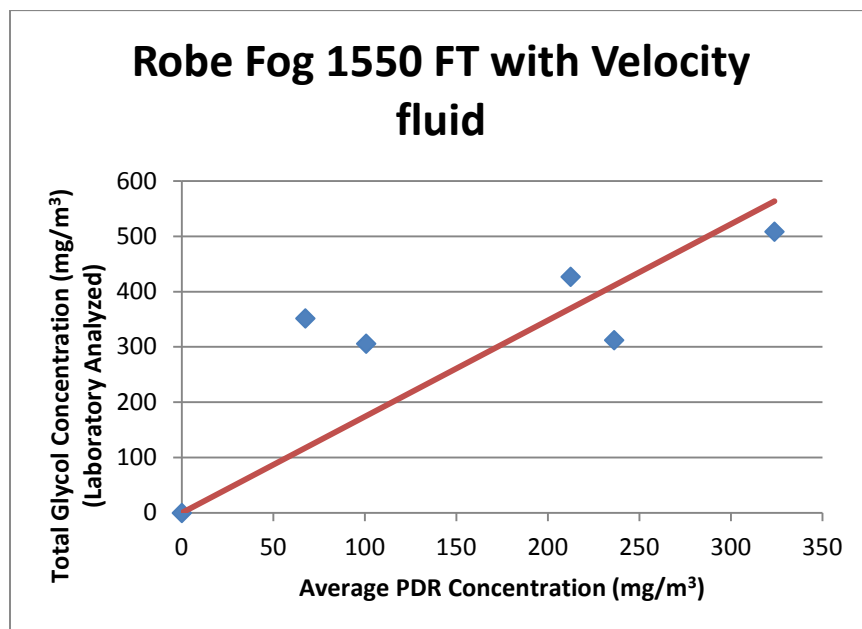
Prepared for Froggy's Fog by ENVIRON International Corporation

ENVIRON developed calibration factors and Time-and-Distance guidelines for the use of Froggy's Fog Velocity fluid in a Robe Fog 1550 FT fog generator.

Velocity is a glycol-based fog fluid. Calibration factors were developed to allow a Thermo Scientific PDR-1000 aerosol monitor to be used to measure concentrations glycols in the air after being released from the Fog 1550 FT.

The measured concentrations should be compared against the peak exposure guidance level for glycols, which is 40 mg/m<sup>3</sup>.

The calibration curve for glycols is shown below:



**Figure 1.** Calibration curve for Robe Fog 1550 FT with Velocity fluid, based on glycol laboratory data. Calibration factor, based on slope of curve, is 1.74 (mg/m<sup>3</sup> glycol) / (mg/m<sup>3</sup> aerosol).

Summary of Calibration Factor				
Manufacturer	Machine	Fluid	Fluid Type	Calibration Factor
Robe	Fog 1550 FT	Velocity	Glycol	1.74

**Time and Distance Guidelines.** For various distances from the cue release point, the following table provides the average time (in seconds) after the end of the cue release after which the glycol concentrations will have fallen below the guidance levels. Thus, in order to prevent peak exposures to actors, the blocking and choreography should be arranged such that actors are not situated within a particular distance from the front of the fog release point until the amount of time listed in this table has elapsed following the end of the cue. For example, if a production is using the Robe Fog 1550 FT/Velocity combination at 100% output with 15-second cue duration, an actor should not be situated within five feet from the front of the cue release point until at least 20 seconds following the end of the cue release.

Summary of Time-and-Distance Guidelines for Fog Generation Robe Fog 1550 FT with Velocity Fluid						
Release Duration (secs)	Time (in sec) After Which Air Concentrations Are Below Guidance Level (40 mg/m <sup>3</sup> )					
	Machine Setting	5 ft	10 ft	15 ft	20 ft	25 ft
5	100%	0	0	0	0	0
15	100%	20	0	0	0	0
30*	100%	20	20	0	0	0
30	65%	20	10	0	0	0
60	65%	20	10	0	0	0
120	65%	20	10	0	0	0
60	25%	0	0	0	0	0
120	25%	0	0	0	0	0

\*Machine ran at reduced output volume after 20 seconds

It should be reiterated that the Time-and-Distance Guidelines provided above are intended to allow a production to use the tested equipment and fluid combinations without conducting monitoring. However, these Guidelines may not be appropriate for all productions. Productions may want to use different configurations for positioning the machine (e.g., different heights), provide on-stage ventilation, or generate fog for a shorter or longer period of time. In addition, many productions may have other stage-specific conditions (e.g., on-stage activities and props that enhance dispersion) that would allow actors to be present in areas that are restricted under these Guidelines but which, in fact, do not exceed the guidance levels. In those cases, production-specific monitoring would be recommended to evaluate whether peak exposure may occur.



## Calibration Factor and Time-and-Distance Guidelines

### Robe Fog 1550 FT with Cryo Freeze Fluid

Prepared for Froggy's Fog by ENVIRON International Corporation

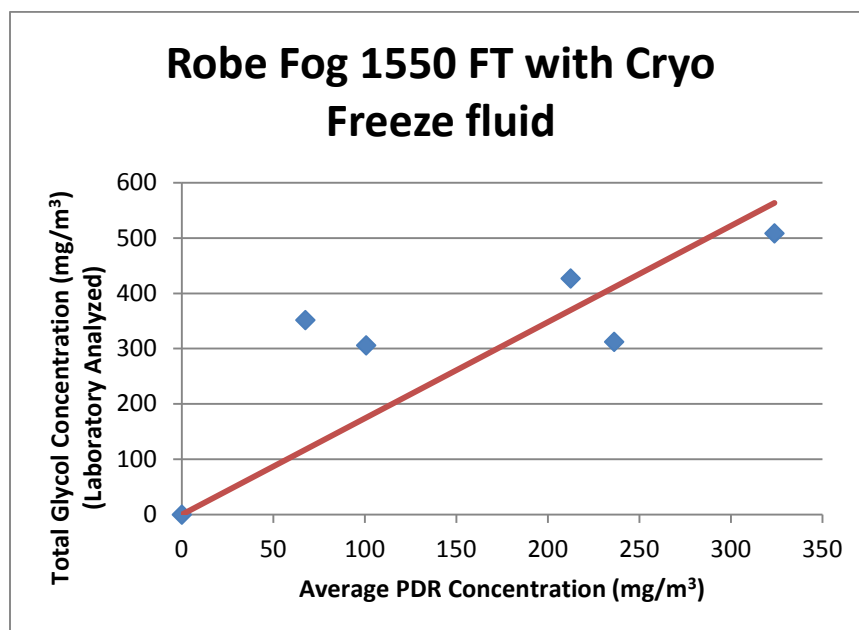
ENVIRON developed calibration factors and Time-and-Distance guidelines for the use of Froggy's Fog Cryo Freeze fluid in a Robe Fog 1550 FT fog generator.

Cryo Freeze is a glycol-based fog fluid. Calibration factors were developed to allow a Thermo Scientific PDR-1000 aerosol monitor to be used to measure concentrations glycols in the air after being released from the Fog 1550 FT.

The measured concentrations should be compared against the peak exposure guidance level for glycols, which is 40 mg/m<sup>3</sup>.



The calibration curve for glycols is shown below:



**Figure 1.** Calibration curve for Robe Fog 1550 FT with Cryo Freeze fluid, based on glycol laboratory data. Calibration factor, based on slope of curve, is 1.74 (mg/m<sup>3</sup> glycol) / (mg/m<sup>3</sup> aerosol).

Summary of Calibration Factor				
Manufacturer	Machine	Fluid	Fluid Type	Calibration Factor
Robe	Fog 1550 FT	Cryo Freeze	Glycol	1.74

**Time and Distance Guidelines.** For various distances from the cue release point, the following table provides the average time (in seconds) after the end of the cue release after which the glycol concentrations will have fallen below the guidance levels. Thus, in order to prevent peak exposures to actors, the blocking and choreography should be arranged such that actors are not situated within a particular distance from the front of the fog release point until the amount of time listed in this table has elapsed following the end of the cue. For example, if a production is using the Robe Fog 1550 FT/Cryo Freeze combination at 100% output with 15-second cue duration, an actor should not be situated within five feet from the front of the cue release point until at least 20 seconds following the end of the cue release.

Summary of Time-and-Distance Guidelines for Fog Generation Robe Fog 1550 FT with Cryo Freeze Fluid						
Release Duration (secs)	Time (in sec) After Which Air Concentrations Are Below Guidance Level (40 mg/m <sup>3</sup> )					
	Machine Setting	5 ft	10 ft	15 ft	20 ft	25 ft
5	100%	0	0	0	0	0
15	100%	20	0	0	0	0
30*	100%	20	20	0	0	0
30	65%	20	10	0	0	0
60	65%	20	10	0	0	0
120	65%	20	10	0	0	0
60	25%	0	0	0	0	0
120	25%	0	0	0	0	0

\*Machine ran at reduced output volume after 20 seconds

It should be reiterated that the Time-and-Distance Guidelines provided above are intended to allow a production to use the tested equipment and fluid combinations without conducting monitoring. However, these Guidelines may not be appropriate for all productions. Productions may want to use different configurations for positioning the machine (e.g., different heights), provide on-stage ventilation, or generate fog for a shorter or longer period of time. In addition, many productions may have other stage-specific conditions (e.g., on-stage activities and props that enhance dispersion) that would allow actors to be present in areas that are restricted under these Guidelines but which, in fact, do not exceed the guidance levels. In those cases, production-specific monitoring would be recommended to evaluate whether peak exposure may occur.



## Calibration Factor and Time-and-Distance Guidelines

### Robe Fog 1550 FT with Quick Blast Fluid

Prepared for Froggy's Fog by ENVIRON International Corporation

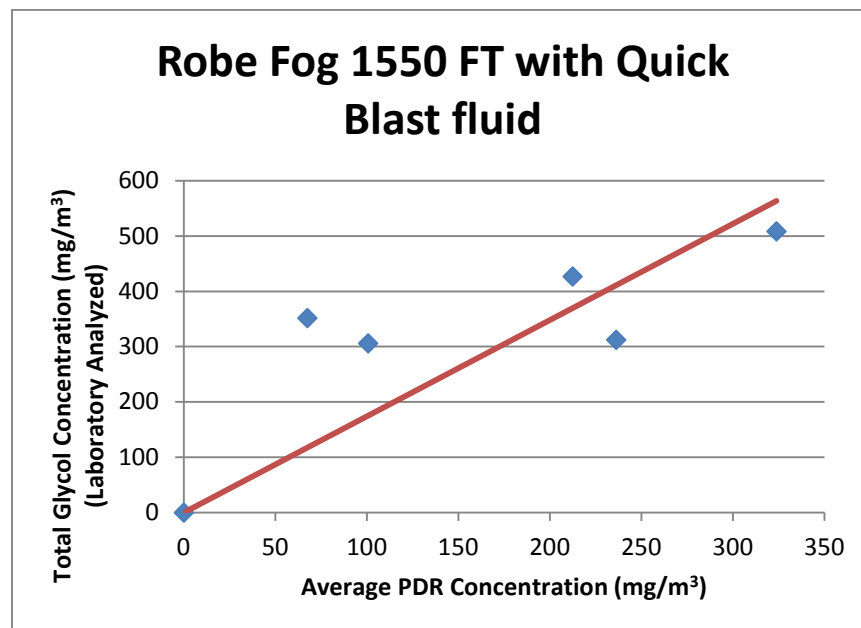
ENVIRON developed calibration factors and Time-and-Distance guidelines for the use of Froggy's Fog Quick Blast fluid in a Robe Fog 1550 FT fog generator.

Quick Blast is a glycol-based fog fluid. Calibration factors were developed to allow a Thermo Scientific PDR-1000 aerosol monitor to be used to measure concentrations glycols in the air after being released from the Fog 1550 FT.

The measured concentrations should be compared against the peak exposure guidance level for glycols, which is 40 mg/m<sup>3</sup>.



The calibration curve for glycols is shown below:



**Figure 1.** Calibration curve for Robe Fog 1550 FT with Quick Blast fluid, based on glycol laboratory data. Calibration factor, based on slope of curve, is 1.74 (mg/m<sup>3</sup> glycol) / (mg/m<sup>3</sup> aerosol).

Summary of Calibration Factor				
Manufacturer	Machine	Fluid	Fluid Type	Calibration Factor
Robe	Fog 1550 FT	Quick Blast	Glycol	1.74

**Time and Distance Guidelines.** For various distances from the cue release point, the following table provides the average time (in seconds) after the end of the cue release after which the glycol concentrations will have fallen below the guidance levels. Thus, in order to prevent peak exposures to actors, the blocking and choreography should be arranged such that actors are not situated within a particular distance from the front of the fog release point until the amount of time listed in this table has elapsed following the end of the cue. For example, if a production is using the Robe Fog 1550 FT/Quick Blast combination at 100% output with 15-second cue duration, an actor should not be situated within five feet from the front of the cue release point until at least 20 seconds following the end of the cue release.

Summary of Time-and-Distance Guidelines for Fog Generation Robe Fog 1550 FT with Quick Blast Fluid						
Release Duration (secs)	Time (in sec) After Which Air Concentrations Are Below Guidance Level (40 mg/m <sup>3</sup> )					
	Machine Setting	5 ft	10 ft	15 ft	20 ft	25 ft
5	100%	0	0	0	0	0
15	100%	20	0	0	0	0
30*	100%	20	20	0	0	0
30	65%	20	10	0	0	0
60	65%	20	10	0	0	0
120	65%	20	10	0	0	0
60	25%	0	0	0	0	0
120	25%	0	0	0	0	0

\*Machine ran at reduced output volume after 20 seconds

It should be reiterated that the Time-and-Distance Guidelines provided above are intended to allow a production to use the tested equipment and fluid combinations without conducting monitoring. However, these Guidelines may not be appropriate for all productions. Productions may want to use different configurations for positioning the machine (e.g., different heights), provide on-stage ventilation, or generate fog for a shorter or longer period of time. In addition, many productions may have other stage-specific conditions (e.g., on-stage activities and props that enhance dispersion) that would allow actors to be present in areas that are restricted under these Guidelines but which, in fact, do not exceed the guidance levels. In those cases, production-specific monitoring would be recommended to evaluate whether peak exposure may occur.



## Calibration Factor and Time-and-Distance Guidelines

### Ultratec G3000 Fog Effects Generator with Backwood Bay Fluid

Prepared for Froggy's Fog by ENVIRON International Corporation

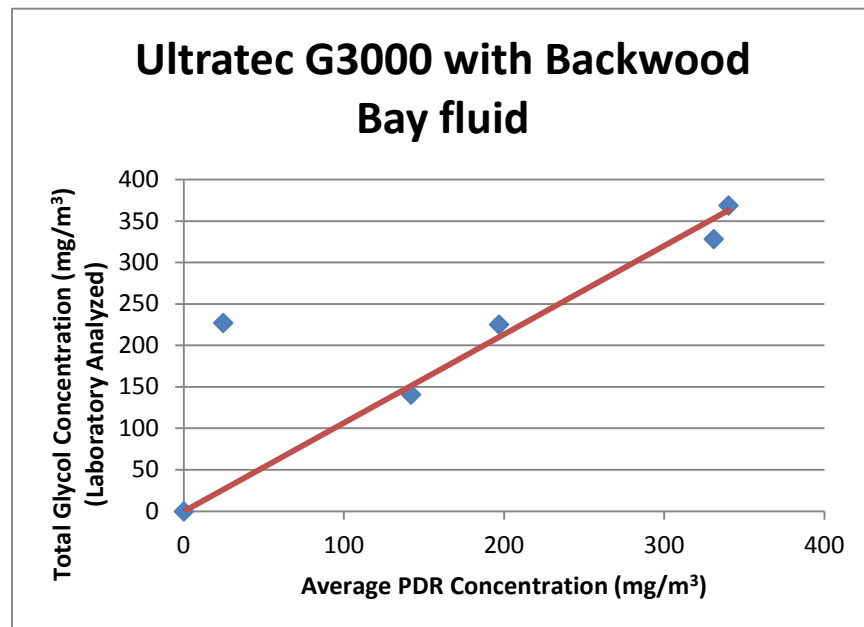
ENVIRON developed calibration factors and Time-and-Distance guidelines for the use of Froggy's Fog Backwood Bay fluid in an Ultratec G3000 fog generator.

Backwood Bay is a glycol-based fog fluid. Calibration factors were developed to allow a Thermo Scientific PDR-1000 aerosol monitor to be used to measure concentrations glycols in the air after being released from the G3000.

The measured concentrations should be compared against the peak exposure guidance level for glycols, which is 40 mg/m<sup>3</sup>.



The calibration curve for glycols is shown below:



**Figure 1.** Calibration curve for Ultratec G3000 with Backwood Bay fluid, based on glycol laboratory data. Calibration factor, based on slope of curve, is 1.07 (mg/m<sup>3</sup> glycol) / (mg/m<sup>3</sup> aerosol).

Summary of Calibration Factor				
Manufacturer	Machine	Fluid	Fluid Type	Calibration Factor
Ultratec	G3000	Backwood Bay	Glycol	1.07

**Time and Distance Guidelines.** For various distances from the cue release point, the following table provides the average time (in seconds) after the end of the cue release after which the glycol concentrations will have fallen below the guidance levels. Thus, in order to prevent peak exposures to actors, the blocking and choreography should be arranged such that actors are not situated within a particular distance from the front of the fog release point until the amount of time listed in this table has elapsed following the end of the cue. For example, if a production is using the Ultratec G3000/Backwood Bay combination at 100% output with 30-second cue duration, an actor should not be situated within five to 15 feet from the front of the cue release point until at least 90 seconds following the end of the cue release.

Summary of Time-and-Distance Guidelines for Fog Generation Ultratec G3000 with Backwood Bay Fluid						
Release Duration (secs)	Time (in sec) After Which Air Concentrations Are Below Guidance Level (40 mg/m <sup>3</sup> )					
	Machine Setting	5 ft	10 ft	15 ft	20 ft	25 ft
15*	100%	90	90	90	30	0
30	100%	90	90	90	60	0
30	65%	50	50	50	0	0
60	65%	100	60	60	30	0
120†	65%	100	60	60	30	0
60	25%	100	60	30	30	0
120†	25%	100	60	30	30	0

\*Machine takes 6 seconds to release fog after button is pressed

† Machine runs at reduced output volume after 60 seconds

It should be reiterated that the Time-and-Distance Guidelines provided above are intended to allow a production to use the tested equipment and fluid combinations without conducting monitoring. However, these Guidelines may not be appropriate for all productions. Productions may want to use different configurations for positioning the machine (e.g., different heights), provide on-stage ventilation, or generate fog for a shorter or longer period of time. In addition, many productions may have other stage-specific conditions (e.g., on-stage activities and props that enhance dispersion) that would allow actors to be present in areas that are restricted under these Guidelines but which, in fact, do not exceed the guidance levels. In those cases, production-specific monitoring would be recommended to evaluate whether peak exposure may occur.





## Calibration Factor and Time-and-Distance Guidelines

### Ultratec G3000 Fog Effects Generator with Amusement Park Fluid

Prepared for Froggy's Fog by ENVIRON International Corporation

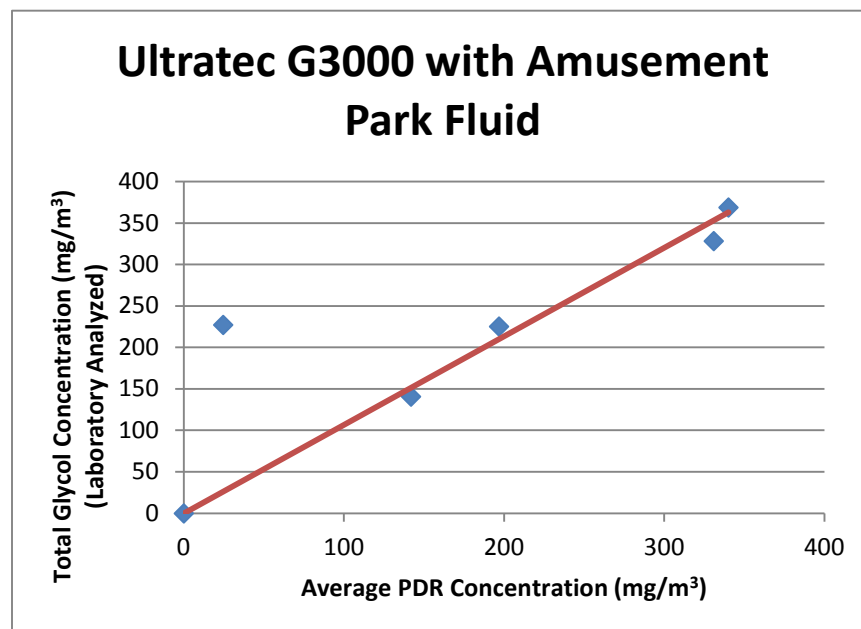
ENVIRON developed calibration factors and Time-and-Distance guidelines for the use of Froggy's Fog Amusement Park Fluid in an Ultratec G3000 fog generator.

Amusement Park Fluid is a glycol-based fog fluid. Calibration factors were developed to allow a Thermo Scientific PDR-1000 aerosol monitor to be used to measure concentrations glycols in the air after being released from the G3000.

The measured concentrations should be compared against the peak exposure guidance level for glycols, which is  $40 \text{ mg/m}^3$ .



The calibration curve for glycols is shown below:



**Figure 1.** Calibration curve for Ultratec G3000 with Amusement Park Fluid, based on glycol laboratory data. Calibration factor, based on slope of curve, is  $1.07 \text{ (mg/m}^3 \text{ glycol) / (mg/m}^3 \text{ aerosol)}$ .

Summary of Calibration Factor				
Manufacturer	Machine	Fluid	Fluid Type	Calibration Factor
Ultratec	G3000	Amusement Park Fluid	Glycol	1.07

**Time and Distance Guidelines.** For various distances from the cue release point, the following table provides the average time (in seconds) after the end of the cue release after which the glycol concentrations will have fallen below the guidance levels. Thus, in order to prevent peak exposures to actors, the blocking and choreography should be arranged such that actors are not situated within a particular distance from the front of the fog release point until the amount of time listed in this table has elapsed following the end of the cue. For example, if a production is using the Ultratec G3000/Amusement Park Fluid combination at 100% output with 30-second cue duration, an actor should not be situated within five to 15 feet from the front of the cue release point until at least 90 seconds following the end of the cue release.

Summary of Time-and-Distance Guidelines for Fog Generation Ultratec G3000 with Amusement Park Fluid						
Release Duration (secs)	Time (in sec) After Which Air Concentrations Are Below Guidance Level (40 mg/m <sup>3</sup> )					
	Machine Setting	5 ft	10 ft	15 ft	20 ft	25 ft
15*	100%	90	90	90	30	0
30	100%	90	90	90	60	0
30	65%	50	50	50	0	0
60	65%	100	60	60	30	0
120†	65%	100	60	60	30	0
60	25%	100	60	30	30	0
120†	25%	100	60	30	30	0

\*Machine takes 6 seconds to release fog after button is pressed

† Machine runs at reduced output volume after 60 seconds

It should be reiterated that the Time-and-Distance Guidelines provided above are intended to allow a production to use the tested equipment and fluid combinations without conducting monitoring. However, these Guidelines may not be appropriate for all productions. Productions may want to use different configurations for positioning the machine (e.g., different heights), provide on-stage ventilation, or generate fog for a shorter or longer period of time. In addition, many productions may have other stage-specific conditions (e.g., on-stage activities and props that enhance dispersion) that would allow actors to be present in areas that are restricted under these Guidelines but which, in fact, do not exceed the guidance levels. In those cases, production-specific monitoring would be recommended to evaluate whether peak exposure may occur.



## Calibration Factor and Time-and-Distance Guidelines

### Ultratec G3000 Fog Effects Generator with Bog Fog Fluid

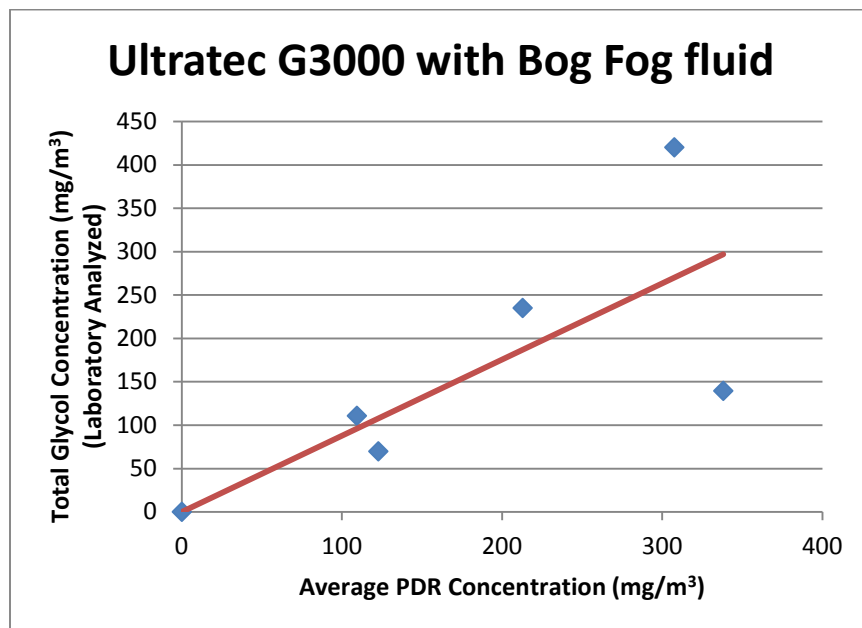
Prepared for Froggy's Fog by ENVIRON International Corporation

ENVIRON developed calibration factors and Time-and-Distance guidelines for the use of Froggy's Fog Bog Fog fluid in an Ultratec G3000 fog generator.

Backwood Bay is a glycol-based fog fluid. Calibration factors were developed to allow a Thermo Scientific PDR-1000 aerosol monitor to be used to measure concentrations glycols in the air after being released from the G3000.

The measured concentrations should be compared against the peak exposure guidance level for glycols, which is 40 mg/m<sup>3</sup>.

The calibration curve for glycols is shown below:



**Figure 1.** Calibration curve for Ultratec G3000 with Bog Fog fluid, based on glycol laboratory data. Calibration factor, based on slope of curve, is 0.88 (mg/m<sup>3</sup> glycol) / (mg/m<sup>3</sup> aerosol).

Summary of Calibration Factor				
Manufacturer	Machine	Fluid	Fluid Type	Calibration Factor
Ultratec	G3000	Bog Fog	Glycol	0.88

**Time and Distance Guidelines.** For various distances from the cue release point, the following table provides the average time (in seconds) after the end of the cue release after which the glycol concentrations will have fallen below the guidance levels. Thus, in order to prevent peak exposures to actors, the blocking and choreography should be arranged such that actors are not situated within a particular distance from the front of the fog release point until the amount of time listed in this table has elapsed following the end of the cue. For example, if a production is using the Ultratec G3000/Bog Fog combination at 100% output with 30-second cue duration, an actor should not be situated within five to 25 feet from the front of the cue release point until at least 60 seconds following the end of the cue release.

Summary of Time-and-Distance Guidelines for Fog Generation Ultratec G3000 with Bog Fog Fluid						
Release Duration (secs)	Time (in sec) After Which Air Concentrations Are Below Guidance Level (40 mg/m <sup>3</sup> )					
	Machine Setting	5 ft	10 ft	15 ft	20 ft	25 ft
15*	100%	50	50	50	50	50
30	100%	60	60	60	60	60
30	65%	60	60	60	60	60
60	65%	70	70	60	60	60
120 <sup>†</sup>	65%	70	70	60	60	60
60	25%	60	0	0	0	0
120 <sup>†</sup>	25%	60	0	0	0	0

\*Machine takes 6 seconds to release fog after button is pressed

<sup>†</sup> Machine runs at significantly reduced output volume after 80 seconds

It should be reiterated that the Time-and-Distance Guidelines provided above are intended to allow a production to use the tested equipment and fluid combinations without conducting monitoring. However, these Guidelines may not be appropriate for all productions. Productions may want to use different configurations for positioning the machine (e.g., different heights), provide on-stage ventilation, or generate fog for a shorter or longer period of time. In addition, many productions may have other stage-specific conditions (e.g., on-stage activities and props that enhance dispersion) that would allow actors to be present in areas that are restricted under these Guidelines but which, in fact, do not exceed the guidance levels. In those cases, production-specific monitoring would be recommended to evaluate whether peak exposure may occur.



## Calibration Factor and Time-and-Distance Guidelines

### Ultratec G3000 Fog Effects Generator with Velocity Fluid

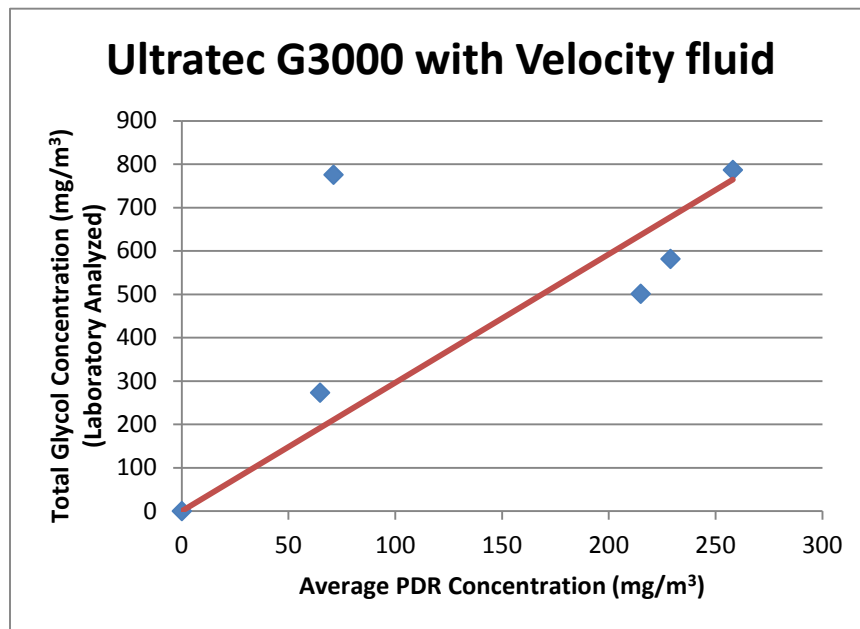
Prepared for Froggy's Fog by ENVIRON International Corporation

ENVIRON developed calibration factors and Time-and-Distance guidelines for the use of Froggy's Fog Velocity fluid in an Ultratec G3000 fog generator.

Velocity is a glycol-based fog fluid. Calibration factors were developed to allow a Thermo Scientific PDR-1000 aerosol monitor to be used to measure concentrations glycols in the air after being released from the G3000.

The measured concentrations should be compared against the peak exposure guidance level for glycols, which is 40 mg/m<sup>3</sup>.

The calibration curve for glycols is shown below:



**Figure 1.** Calibration curve for Ultratec G3000 with Velocity fluid, based on glycol laboratory data. Calibration factor, based on slope of curve, is 2.96 (mg/m<sup>3</sup> glycol) / (mg/m<sup>3</sup> aerosol).

Summary of Calibration Factor				
Manufacturer	Machine	Fluid	Fluid Type	Calibration Factor
Ultratec	G3000	Velocity	Glycol	2.96

**Time and Distance Guidelines.** For various distances from the cue release point, the following table provides the average time (in seconds) after the end of the cue release after which the glycol concentrations will have fallen below the guidance levels. Thus, in order to prevent peak exposures to actors, the blocking and choreography should be arranged such that actors are not situated within a particular distance from the front of the fog release point until the amount of time listed in this table has elapsed following the end of the cue. For example, if a production is using the Ultratec G3000/Velocity combination at 100% output with 30-second cue duration, an actor should not be situated within five to 10 feet from the front of the cue release point until at least 40 seconds following the end of the cue release.

Summary of Time-and-Distance Guidelines for Fog Generation Ultratec G3000 with Velocity Fluid						
Release Duration (secs)	Time (in sec) After Which Air Concentrations Are Below Guidance Level (40 mg/m <sup>3</sup> )					
	Machine Setting	5 ft	10 ft	15 ft	20 ft	25 ft
15*	100%	30	30	0	0	0
30	100%	40	40	30	20	20
30	65%	30	20	0	0	0
60	65%	30	30	0	0	0
120 <sup>†</sup>	65%	30	30	0	0	0
60	25%	30	0	0	0	0
120 <sup>†</sup>	25%	30	0	0	0	0

\*Machine takes 6 seconds to release fog after button is pressed

<sup>†</sup> Machine runs at significantly reduced output volume after 80 seconds

It should be reiterated that the Time-and-Distance Guidelines provided above are intended to allow a production to use the tested equipment and fluid combinations without conducting monitoring. However, these Guidelines may not be appropriate for all productions. Productions may want to use different configurations for positioning the machine (e.g., different heights), provide on-stage ventilation, or generate fog for a shorter or longer period of time. In addition, many productions may have other stage-specific conditions (e.g., on-stage activities and props that enhance dispersion) that would allow actors to be present in areas that are restricted under these Guidelines but which, in fact, do not exceed the guidance levels. In those cases, production-specific monitoring would be recommended to evaluate whether peak exposure may occur.



## Calibration Factor and Time-and-Distance Guidelines

### Ultratec G3000 Fog Effects Generator with Cryo Freeze Fluid

Prepared for Froggy's Fog by ENVIRON International Corporation

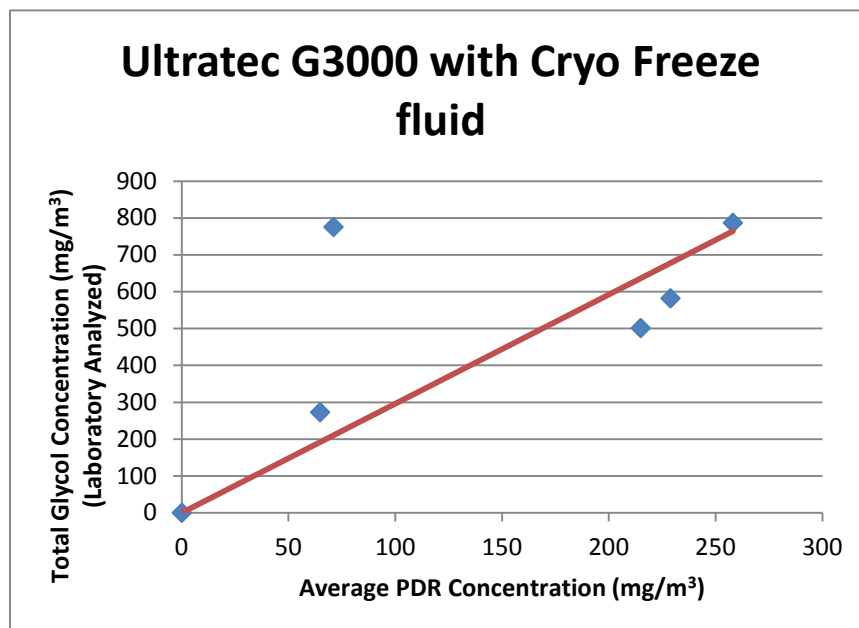
ENVIRON developed calibration factors and Time-and-Distance guidelines for the use of Froggy's Fog Cryo Freeze fluid in an Ultratec G3000 fog generator.

Cryo Freeze is a glycol-based fog fluid. Calibration factors were developed to allow a Thermo Scientific PDR-1000 aerosol monitor to be used to measure concentrations glycols in the air after being released from the G3000.

The measured concentrations should be compared against the peak exposure guidance level for glycols, which is  $40 \text{ mg/m}^3$ .



The calibration curve for glycols is shown below:



**Figure 1.** Calibration curve for Ultratec G3000 with Cryo Freeze fluid, based on glycol laboratory data. Calibration factor, based on slope of curve, is  $2.96 \text{ (mg/m}^3 \text{ glycol) / (mg/m}^3 \text{ aerosol)}$ .

Summary of Calibration Factor				
Manufacturer	Machine	Fluid	Fluid Type	Calibration Factor
Ultratec	G3000	Cryo Freeze	Glycol	2.96

**Time and Distance Guidelines.** For various distances from the cue release point, the following table provides the average time (in seconds) after the end of the cue release after which the glycol concentrations will have fallen below the guidance levels. Thus, in order to prevent peak exposures to actors, the blocking and choreography should be arranged such that actors are not situated within a particular distance from the front of the fog release point until the amount of time listed in this table has elapsed following the end of the cue. For example, if a production is using the Ultratec G3000/Cryo Freeze combination at 100% output with 30-second cue duration, an actor should not be situated within five to 10 feet from the front of the cue release point until at least 40 seconds following the end of the cue release.

Summary of Time-and-Distance Guidelines for Fog Generation Ultratec G3000 with Cryo Freeze Fluid						
Release Duration (secs)	Time (in sec) After Which Air Concentrations Are Below Guidance Level (40 mg/m <sup>3</sup> )					
	Machine Setting	5 ft	10 ft	15 ft	20 ft	25 ft
15*	100%	30	30	0	0	0
30	100%	40	40	30	20	20
30	65%	30	20	0	0	0
60	65%	30	30	0	0	0
120†	65%	30	30	0	0	0
60	25%	30	0	0	0	0
120†	25%	30	0	0	0	0

\*Machine takes 6 seconds to release fog after button is pressed

† Machine runs at significantly reduced output volume after 80 seconds

It should be reiterated that the Time-and-Distance Guidelines provided above are intended to allow a production to use the tested equipment and fluid combinations without conducting monitoring. However, these Guidelines may not be appropriate for all productions. Productions may want to use different configurations for positioning the machine (e.g., different heights), provide on-stage ventilation, or generate fog for a shorter or longer period of time. In addition, many productions may have other stage-specific conditions (e.g., on-stage activities and props that enhance dispersion) that would allow actors to be present in areas that are restricted under these Guidelines but which, in fact, do not exceed the guidance levels. In those cases, production-specific monitoring would be recommended to evaluate whether peak exposure may occur.





## Calibration Factor and Time-and-Distance Guidelines

### Ultratec G3000 Fog Effects Generator with Quick Blast Fluid

Prepared for Froggy's Fog by ENVIRON International Corporation

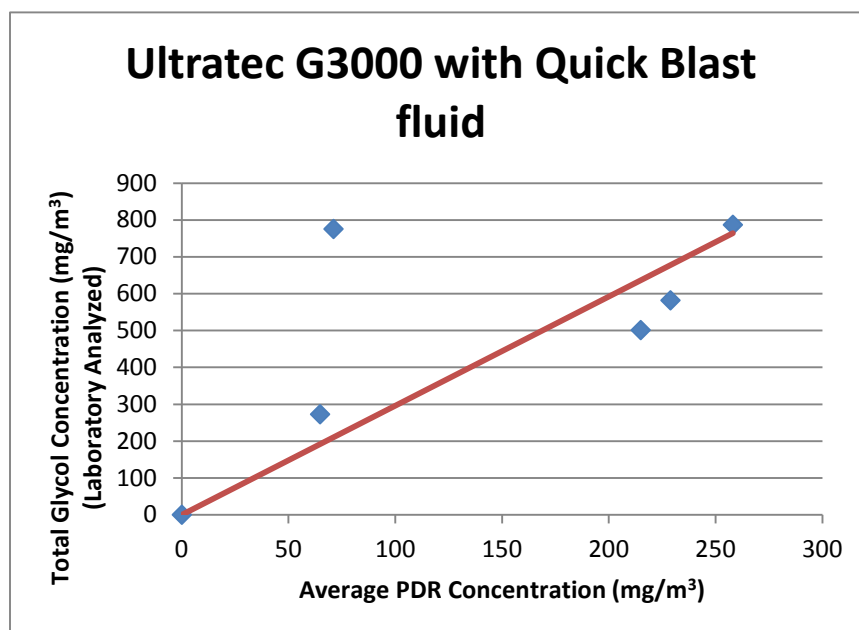
ENVIRON developed calibration factors and Time-and-Distance guidelines for the use of Froggy's Fog Quick Blast fluid in an Ultratec G3000 fog generator.

Quick Blast is a glycol-based fog fluid. Calibration factors were developed to allow a Thermo Scientific PDR-1000 aerosol monitor to be used to measure concentrations glycols in the air after being released from the G3000.

The measured concentrations should be compared against the peak exposure guidance level for glycols, which is  $40 \text{ mg/m}^3$ .



The calibration curve for glycols is shown below:



**Figure 1.** Calibration curve for Ultratec G3000 with Quick Blast fluid, based on glycol laboratory data. Calibration factor, based on slope of curve, is  $2.96 \text{ (mg/m}^3 \text{ glycol) / (mg/m}^3 \text{ aerosol)}$ .

Summary of Calibration Factor				
Manufacturer	Machine	Fluid	Fluid Type	Calibration Factor
Ultratec	G3000	Quick Blast	Glycol	2.96

**Time and Distance Guidelines.** For various distances from the cue release point, the following table provides the average time (in seconds) after the end of the cue release after which the glycol concentrations will have fallen below the guidance levels. Thus, in order to prevent peak exposures to actors, the blocking and choreography should be arranged such that actors are not situated within a particular distance from the front of the fog release point until the amount of time listed in this table has elapsed following the end of the cue. For example, if a production is using the Ultratec G3000/Quick Blast combination at 100% output with 30-second cue duration, an actor should not be situated within five to 10 feet from the front of the cue release point until at least 40 seconds following the end of the cue release.

Summary of Time-and-Distance Guidelines for Fog Generation Ultratec G3000 with Quick Blast Fluid						
Release Duration (secs)	Time (in sec) After Which Air Concentrations Are Below Guidance Level (40 mg/m <sup>3</sup> )					
	Machine Setting	5 ft	10 ft	15 ft	20 ft	25 ft
15*	100%	30	30	0	0	0
30	100%	40	40	30	20	20
30	65%	30	20	0	0	0
60	65%	30	30	0	0	0
120†	65%	30	30	0	0	0
60	25%	30	0	0	0	0
120†	25%	30	0	0	0	0

\*Machine takes 6 seconds to release fog after button is pressed

† Machine runs at significantly reduced output volume after 80 seconds

It should be reiterated that the Time-and-Distance Guidelines provided above are intended to allow a production to use the tested equipment and fluid combinations without conducting monitoring. However, these Guidelines may not be appropriate for all productions. Productions may want to use different configurations for positioning the machine (e.g., different heights), provide on-stage ventilation, or generate fog for a shorter or longer period of time. In addition, many productions may have other stage-specific conditions (e.g., on-stage activities and props that enhance dispersion) that would allow actors to be present in areas that are restricted under these Guidelines but which, in fact, do not exceed the guidance levels. In those cases, production-specific monitoring would be recommended to evaluate whether peak exposure may occur.



## Calibration Factor and Time-and-Distance Guidelines

### Ultratec Radiance Hazer with Neutronic Haze Fluid

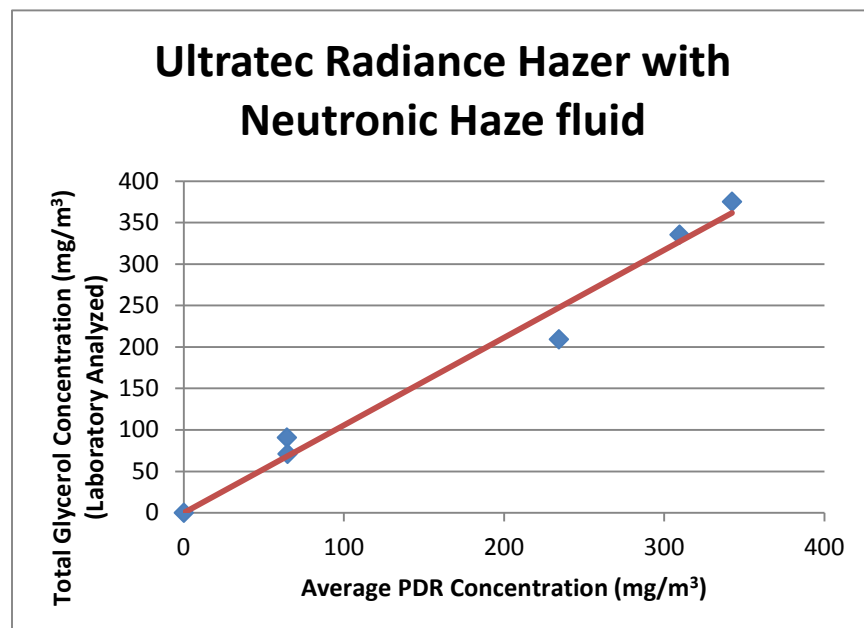
Prepared for Froggy's Fog by ENVIRON International Corporation

ENVIRON developed calibration factors and Time-and-Distance guidelines for the use of Froggy's Fog Neutronic Haze fluid in an Ultratec Radiance Hazer haze generator.

Neutronic Haze is a glycerol-based fog fluid. Calibration factors were developed to allow a Thermo Scientific PDR-1000 aerosol monitor to be used to measure concentrations glycerols in the air after being released from the Radiance Hazer.

The measured concentrations should be compared against the peak exposure guidance level for glycerols, which is 50 mg/m<sup>3</sup>.

The calibration curve for glycerols is shown below:



**Figure 1.** Calibration curve for Ultratec Radiance Hazer with Neutronic Haze fluid, based on glycerol laboratory data. Calibration factor, based on slope of curve, is 1.06 (mg/m<sup>3</sup> glycerol) / (mg/m<sup>3</sup> aerosol).

Summary of Calibration Factor				
Manufacturer	Machine	Fluid	Fluid Type	Calibration Factor
Ultratec	Radiance Hazer	Neutronic Haze	Glycerol	1.06

**Time and Distance Guidelines.** For various distances from the cue release point, the following table provides the average time (in seconds) after the end of the cue release after which the glycerol concentrations will have fallen below the guidance levels. Thus, in order to prevent peak exposures to actors, the blocking and choreography should be arranged such that actors are not situated within a particular distance from the front of the fog release point until the amount of time listed in this table has elapsed following the end of the cue. For example, if a production is using the Ultratec Radiance Hazer/Neutronic Haze combination operating at an output setting of 9 and a fan setting of 9 with 60-second cue duration, an actor should not be situated within four to 20 feet from the front of the cue release point until at least 20 seconds following the end of the cue release.

Summary of Time-and-Distance Guidelines for Fog Generation Ultratec Radiance Hazer with Neutronic Fluid							
Release Duration (secs)	Fan Speed	Output Setting	Time* (in sec) After Which Air Concentrations Are Below Guidance Level (50 mg/m <sup>3</sup> )				
			4 ft	8 ft	12 ft	16 ft	20 ft
30	9	9	20	20	20	20	20
60	9	9	20	20	20	20	20
120	9	9	30	30	30	30	30
60	9	1	10	0	0	0	0
120	9	1	30	30	0	0	0
30	5	9	20	20	0	0	0
60	5	9	40	40	40	0	0
120	5	9	40	40	40	0	0
30	1	9	0	0	0	0	0
60	1	9	30	0	0	0	0
120	1	9	30	0	0	0	0

\*Times are measured from start of fog release

It should be reiterated that the Time-and-Distance Guidelines provided above are intended to allow a production to use the tested equipment and fluid combinations without conducting monitoring. However, these Guidelines may not be appropriate for all productions. Productions may want to use different configurations for positioning the machine (e.g., different heights), provide on-stage ventilation, or generate fog for a shorter or longer period of time. In addition, many productions may have other stage-specific conditions (e.g., on-stage activities and props that enhance dispersion) that would allow actors to be present in areas that are restricted under these Guidelines but which, in fact, do not exceed the guidance levels. In those cases, production-specific monitoring would be recommended to evaluate whether peak exposure may occur.

## **Appendix D: Safety Data Sheets**





# Amusement Fog Fluid Long Lasting Formula

## Safety Data Sheet

Froggy's Fog LLC  
302 Rutherford Lane  
Columbia, TN 38401  
United States  
Phone: (615) 469-4906

according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 /  
Rules and Regulations

Version: 1.0  
Revision Date: 10/20/2014

### SECTION 1: IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY

#### 1.1. Product Identifier

**Product Form:** Mixture

**Product Name:** Amusement Fog Fluid - Long Lasting Formula

#### 1.2. Intended Use of the Product

**Use of the Substance/Mixture:** Theatrical Fog/Haze

#### 1.3. Name, Address, and Telephone of the Responsible Party

**Froggy's Fog LLC**

302 Rutherford Lane

Columbia, TN 38401

1-615-469-4906

[www.froggysfog.com](http://www.froggysfog.com)

#### 1.4. Emergency Telephone Number

Chemtrec: (800) 424-9300

### SECTION 2: HAZARDS IDENTIFICATION

#### 2.1. Classification of the Substance or Mixture

**Classification (GHS-US)**

Not classified

#### 2.2. Label Elements

**GHS-US Labeling**

No labeling required

#### 2.3. Other Hazards

**Other Hazards Not Contributing to the Classification:** Exposure may aggravate those with pre-existing eye, skin, or respiratory conditions.

#### 2.4. Unknown Acute Toxicity (GHS-US)

No data available

### SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

#### 3.1. Substance

Not applicable

#### 3.2. Mixture

Name	Product Identifier	%	Classification (GHS-US)
Water	(CAS No) 7732-18-5	Proprietary	Not classified
Triethylene glycol	(CAS No) 112-27-6	Proprietary	Not classified
1,2-Propylene glycol	(CAS No) 57-55-6	Proprietary	Not classified

The specific chemical identity and/or exact percentage of composition has been withheld as a trade secret.

Full text of H-phrases: see section 16

### SECTION 4: FIRST AID MEASURES

#### 4.1. Description of First Aid Measures

**First-aid Measures General:** Never give anything by mouth to an unconscious person. If you feel unwell, seek medical advice (show the label where possible).

**First-aid Measures After Inhalation:** When symptoms occur: go into open air and ventilate suspected area. Obtain medical attention if breathing difficulty persists.

**First-aid Measures After Skin Contact:** Remove contaminated clothing. Drench affected area with water for at least 15 minutes. Obtain medical attention if irritation develops or persists.

**First-aid Measures After Eye Contact:** Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Obtain medical attention if pain, blinking or redness persist.

**First-aid Measures After Ingestion:** Rinse mouth. Do NOT induce vomiting. Seek medical attention.

# Amusement Fog Fluid - Long Lasting Formula

## Safety Data Sheet

according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

### 4.2. Most important symptoms and effects, both acute and delayed

**Symptoms/Injuries:** Not expected to present a significant hazard under anticipated conditions of normal use.

**Symptoms/Injuries After Inhalation:** None expected under normal conditions of use.

**Symptoms/Injuries After Skin Contact:** None expected under normal conditions of use.

**Symptoms/Injuries After Eye Contact:** None expected under normal conditions of use.

**Symptoms/Injuries After Ingestion:** None expected under normal conditions of use.

### 4.3. Indication of Any Immediate Medical Attention and Special Treatment Needed

If you feel unwell, seek medical advice (show the label where possible).

## SECTION 5: FIREFIGHTING MEASURES

### 5.1. Extinguishing Media

**Suitable Extinguishing Media:** Use extinguishing media appropriate for surrounding fire.

**Unsuitable Extinguishing Media:** Do not use a heavy water stream. Use of heavy stream of water may spread fire.

### 5.2. Special Hazards Arising From the Substance or Mixture

**Fire Hazard:** Not flammable.

**Explosion Hazard:** Product is not explosive.

**Reactivity:** Hazardous reactions will not occur under normal conditions.

### 5.3. Advice for Firefighters

**Precautionary Measures Fire:** Exercise caution when fighting any chemical fire.

**Firefighting Instructions:** Use water spray or fog for cooling exposed containers.

**Protection During Firefighting:** Do not enter fire area without proper protective equipment, including respiratory protection.

**Other information:** Do not allow run-off from fire fighting to enter drains or water courses.

## SECTION 6: ACCIDENTAL RELEASE MEASURES

### 6.1. Personal Precautions, Protective Equipment and Emergency Procedures

**General Measures:** Avoid prolonged contact with eyes, skin and clothing. Avoid breathing (vapors, mist, spray).

#### 6.1.1. For Non-emergency Personnel

**Protective Equipment:** Use appropriate personal protection equipment (PPE).

**Emergency Procedures:** Evacuate unnecessary personnel.

#### 6.1.2. For Emergency Responders

**Protective Equipment:** Equip cleanup crew with proper protection.

**Emergency Procedures:** Ventilate area.

### 6.2. Environmental Precautions

Prevent entry to sewers and public waters.

### 6.3. Methods and Material for Containment and Cleaning Up

**For Containment:** Contain any spills with dikes or absorbents to prevent migration and entry into sewers or streams.

**Methods for Cleaning Up:** Clear up spills immediately and dispose of waste safely. Absorb and/or contain spill with inert material, then place in suitable container.

### 6.4. Reference to Other Sections

See heading 8, Exposure Controls and Personal Protection.

## SECTION 7: HANDLING AND STORAGE

### 7.1. Precautions for Safe Handling

**Hygiene Measures:** Handle in accordance with good industrial hygiene and safety procedures. Wash hands and other exposed areas with mild soap and water before eating, drinking, or smoking and again when leaving work.

### 7.2. Conditions for Safe Storage, Including Any Incompatibilities

**Technical Measures:** Comply with applicable regulations.

**Storage Conditions:** Store in a dry, cool and well-ventilated place. Keep container closed when not in use. Keep/Store away from extremely high or low temperatures, direct sunlight, incompatible materials.

**Incompatible Products:** Strong acids. Strong bases. Strong oxidizers.

### 7.3. Specific End Use(s)

Theatrical Fog/Haze.

## SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

### 8.1. Control Parameters

No Occupational Exposure Limits (OELs) have been established for this product or its chemical components.



# Amusement Fog Fluid - Long Lasting Formula

## Safety Data Sheet

according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

### 8.2. Exposure Controls

<b>Appropriate Engineering Controls</b>	: Ensure adequate ventilation, especially in confined areas. Ensure all national/local regulations are observed.
<b>Personal Protective Equipment</b>	: Not generally required. The use of personal protective equipment may be necessary as conditions warrant.
<b>Materials for Protective Clothing</b>	: Chemically resistant materials and fabrics.
<b>Hand Protection</b>	: Wear chemically resistant protective gloves.
<b>Eye Protection</b>	: Chemical goggles or safety glasses.
<b>Respiratory Protection</b>	: Use NIOSH-approved air-purifying or supplied-air respirator where airborne concentrations of vapor or mist are expected to exceed exposure limits.
<b>Other Information</b>	: When using, do not eat, drink or smoke.

## SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

### 9.1. Information on Basic Physical and Chemical Properties

<b>Physical State</b>	: Liquid
<b>Appearance</b>	: Clear.
<b>Odor</b>	: Odorless.
<b>Odor Threshold</b>	: No data available
<b>pH</b>	: Unknown
<b>Relative Evaporation Rate (butylacetate=1)</b>	: No data available
<b>Melting Point</b>	: No data available
<b>Freezing Point</b>	: -33°C (-27.4°F)
<b>Boiling Point</b>	: 101 °C (213.8°F)
<b>Flash Point</b>	: Does not flash
<b>Auto-ignition Temperature</b>	: No data available
<b>Decomposition Temperature</b>	: No data available
<b>Flammability (solid, gas)</b>	: No data available
<b>Vapor Pressure</b>	: No data available
<b>Relative Vapor Density at 20 °C</b>	: No data available
<b>Relative Density</b>	: No data available
<b>Specific Gravity</b>	: Not available
<b>Solubility</b>	: Soluble in water.
<b>Log Pow</b>	: No data available
<b>Log Kow</b>	: No data available
<b>Viscosity, Kinematic</b>	: No data available
<b>Viscosity, Dynamic</b>	: No data available
<b>Explosive Properties</b>	: No data available
<b>Oxidizing Properties</b>	: No data available
<b>Explosive Limits</b>	: Not applicable

9.2. **Other Information** No additional information available

## SECTION 10: STABILITY AND REACTIVITY

- 10.1 **Reactivity:** Hazardous reactions will not occur under normal conditions.
- 10.2 **Chemical Stability:** Stable under normal conditions.
- 10.3 **Possibility of Hazardous Reactions:** Hazardous polymerization will not occur.
- 10.4 **Conditions to Avoid:** Direct sunlight. Extremely high or low temperatures. Incompatible materials.
- 10.5 **Incompatible Materials:** Strong acids. Strong bases. Strong oxidizers.
- 10.6 **Hazardous Decomposition Products:** Carbon oxides (CO, CO<sub>2</sub>).

## SECTION 11: TOXICOLOGICAL INFORMATION

### 11.1. Information On Toxicological Effects

**Acute Toxicity** : Not classified

# Amusement Fog Fluid - Long Lasting Formula

## Safety Data Sheet

according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

<b>Water (7732-18-5)</b>	
LC50 Inhalation Rat (ppm)	100000 ppm
<b>1,2-Propylene glycol (57-55-6)</b>	
LD50 Oral Rat	20000 mg/kg
LD50 Dermal Rabbit	20800 mg/kg
<b>Triethylene glycol (112-27-6)</b>	
LD50 Oral Rat	15000 mg/kg
LD50 Dermal Rabbit	> 20 ml/kg

**Skin Corrosion/Irritation:** Not classified

pH: unknown

**Serious Eye Damage/Irritation:** Not classified

pH: unknown

**Respiratory or Skin Sensitization:** Not classified

**Germ Cell Mutagenicity:** Not classified

**Carcinogenicity:** Not classified

**Reproductive Toxicity:** Not classified

**Specific Target Organ Toxicity (Single Exposure):** Not classified

**Specific Target Organ Toxicity (Repeated Exposure):** Not classified

**Aspiration Hazard:** Not classified

**Symptoms/Injuries After Inhalation:** None expected under normal conditions of use.

**Symptoms/Injuries After Skin Contact:** None expected under normal conditions of use.

**Symptoms/Injuries After Eye Contact:** None expected under normal conditions of use.

**Symptoms/Injuries After Ingestion:** None expected under normal conditions of use.

## SECTION 12: ECOLOGICAL INFORMATION

### 12.1. Toxicity

<b>1,2-Propylene glycol (57-55-6)</b>	
LC50 Fish 1	51600 mg/l (Exposure time: 96 h - Species: Oncorhynchus mykiss [static])
EC50 Daphnia 1	10000 mg/l (Exposure time: 24 h - Species: Daphnia magna)
EC50 Other Aquatic Organisms 1	19000 mg/l (Exposure time: 96 h - Species: Pseudokirchneriella subcapitata)
LC 50 Fish 2	41 (41 - 47) mg/l (Exposure time: 96 h - Species: Oncorhynchus mykiss [static])
EC50 Daphnia 2	1000 mg/l (Exposure time: 48 h - Species: Daphnia magna [Static])
<b>Triethylene glycol (112-27-6)</b>	
LC50 Fish 1	56200 - 63700 mg/l (Exposure time: 96 h - Species: Pimephales promelas [flow-through])
EC50 Daphnia 1	42426 mg/l (Exposure time: 48 h - Species: Daphnia magna)
LC 50 Fish 2	10000 mg/l (Exposure time: 96 h - Species: Lepomis macrochirus [static])

### 12.2. Persistence and Degradability

<b>Amusement Fog Fluid - Long Lasting Formula</b>	
Persistence and Degradability	Not established.

### 12.3. Bioaccumulative Potential

<b>Amusement Fog Fluid - Long Lasting Formula</b>	
Bioaccumulative Potential	Not established.

<b>1,2-Propylene glycol (57-55-6)</b>	
BCF fish 1	< 1

<b>Triethylene glycol (112-27-6)</b>	
Log Pow	-1.98 (at 25 °C)

**12.4. Mobility in Soil** No additional information available

### 12.5. Other Adverse Effects

**Other Information** : Avoid release to the environment.

# Amusement Fog Fluid - Long Lasting Formula

Safety Data Sheet

according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

## SECTION 13: DISPOSAL CONSIDERATIONS

### 13.1. Waste treatment methods

**Waste Disposal Recommendations:** Dispose of waste material in accordance with all local, regional, national, and international regulations.

## SECTION 14: TRANSPORT INFORMATION

In Accordance With ICAO/IATA/IMDG/DOT

**14.1. UN Number** Not regulated for transport

**14.2. UN Proper Shipping Name** Not regulated for transport

### 14.3. Additional Information

**Other information** : No supplementary information available.

**Transport by Sea** Not regulated for transport

**Air Transport** Not regulated for transport

## SECTION 15: REGULATORY INFORMATION

### 15.1 US Federal Regulations

#### Water (7732-18-5)

Listed on the United States TSCA (Toxic Substances Control Act) inventory

#### 1,2-Propylene glycol (57-55-6)

Listed on the United States TSCA (Toxic Substances Control Act) inventory

#### EPA TSCA Regulatory Flag

Y2 - Y2 - indicates an exempt polymer that is a polyester and is made only from reactants included in a specified list of low concern reactants that comprises one of the eligibility criteria for the exemption rule.

#### Triethylene glycol (112-27-6)

Listed on the United States TSCA (Toxic Substances Control Act) inventory

### 15.2 US State Regulations

#### 1,2-Propylene glycol (57-55-6)

U.S. - Minnesota - Hazardous Substance List  
U.S. - New Jersey - Right to Know Hazardous Substance List  
U.S. - Pennsylvania - RTK (Right to Know) List  
U.S. - Texas - Effects Screening Levels - Long Term  
U.S. - Texas - Effects Screening Levels - Short Term

#### Triethylene glycol (112-27-6)

U.S. - Pennsylvania - RTK (Right to Know) List  
U.S. - Texas - Effects Screening Levels - Long Term  
U.S. - Texas - Effects Screening Levels - Short Term

## SECTION 16: OTHER INFORMATION

**Revision date** : 10/20/2014

**Other Information** : This document has been prepared in accordance with the SDS requirements of the OSHA Hazard Communication Standard 29 CFR 1910.1200.

*This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product*

SDS US (GHS HazCom) - US



# Backwood Bay Long Lasting Fog Fluid

## Safety Data Sheet

Froggy's Fog LLC  
302 Rutherford Lane  
Columbia, TN 38401  
United States  
Phone: (615) 469-4906

according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 /  
Rules and Regulations

Version: 1.0  
Revision Date: 10/20/2014

### SECTION 1: IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY

#### 1.1. Product Identifier

**Product Form:** Mixture

**Product Name:** Backwood Bay - Long Lasting Fog Fluid

#### 1.2. Intended Use of the Product

**Use of the Substance/Mixture:** Theatrical Fog/Haze

#### 1.3. Name, Address, and Telephone of the Responsible Party

**Froggy's Fog LLC**

302 Rutherford Lane

Columbia, TN 38401

1-615-469-4906

[www.froggysfog.com](http://www.froggysfog.com)

#### 1.4. Emergency Telephone Number

Chemtrec: (800) 424-9300

### SECTION 2: HAZARDS IDENTIFICATION

#### 2.1. Classification of the Substance or Mixture

**Classification (GHS-US)**

Not classified

#### 2.2. Label Elements

**GHS-US Labeling**

No labeling required

#### 2.3. Other Hazards

**Other Hazards Not Contributing to the Classification:** Exposure may aggravate those with pre-existing eye, skin, or respiratory conditions.

#### 2.4. Unknown Acute Toxicity (GHS-US)

No data available

### SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

#### 3.1. Substance

Not applicable

#### 3.2. Mixture

Name	Product Identifier	%	Classification (GHS-US)
Water	(CAS No) 7732-18-5	Proprietary	Not classified
Triethylene glycol	(CAS No) 112-27-6	Proprietary	Not classified
1,2-Propylene glycol	(CAS No) 57-55-6	Proprietary	Not classified

The specific chemical identity and/or exact percentage of composition has been withheld as a trade secret.

Full text of H-phrases: see section 16

### SECTION 4: FIRST AID MEASURES

#### 4.1. Description of First Aid Measures

**First-aid Measures General:** Never give anything by mouth to an unconscious person. If you feel unwell, seek medical advice (show the label where possible).

**First-aid Measures After Inhalation:** When symptoms occur: go into open air and ventilate suspected area. Obtain medical attention if breathing difficulty persists.

**First-aid Measures After Skin Contact:** Remove contaminated clothing. Drench affected area with water for at least 15 minutes. Obtain medical attention if irritation develops or persists.

**First-aid Measures After Eye Contact:** Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Obtain medical attention if pain, blinking or redness persist.

**First-aid Measures After Ingestion:** Rinse mouth. Do NOT induce vomiting. Seek medical attention.

# Backwood Bay - Long Lasting Fog Fluid

## Safety Data Sheet

according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

### 4.2. Most important symptoms and effects, both acute and delayed

**Symptoms/Injuries:** Not expected to present a significant hazard under anticipated conditions of normal use.

**Symptoms/Injuries After Inhalation:** None expected under normal conditions of use.

**Symptoms/Injuries After Skin Contact:** None expected under normal conditions of use.

**Symptoms/Injuries After Eye Contact:** None expected under normal conditions of use.

**Symptoms/Injuries After Ingestion:** None expected under normal conditions of use.

### 4.3. Indication of Any Immediate Medical Attention and Special Treatment Needed

If you feel unwell, seek medical advice (show the label where possible).

## SECTION 5: FIREFIGHTING MEASURES

### 5.1. Extinguishing Media

**Suitable Extinguishing Media:** Use extinguishing media appropriate for surrounding fire.

**Unsuitable Extinguishing Media:** Do not use a heavy water stream. Use of heavy stream of water may spread fire.

### 5.2. Special Hazards Arising From the Substance or Mixture

**Fire Hazard:** Not flammable.

**Explosion Hazard:** Product is not explosive.

**Reactivity:** Hazardous reactions will not occur under normal conditions.

### 5.3. Advice for Firefighters

**Precautionary Measures Fire:** Exercise caution when fighting any chemical fire.

**Firefighting Instructions:** Use water spray or fog for cooling exposed containers.

**Protection During Firefighting:** Do not enter fire area without proper protective equipment, including respiratory protection.

**Other information:** Do not allow run-off from fire fighting to enter drains or water courses.

## SECTION 6: ACCIDENTAL RELEASE MEASURES

### 6.1. Personal Precautions, Protective Equipment and Emergency Procedures

**General Measures:** Avoid prolonged contact with eyes, skin and clothing. Avoid breathing (vapors, mist, spray).

#### 6.1.1. For Non-emergency Personnel

**Protective Equipment:** Use appropriate personal protection equipment (PPE).

**Emergency Procedures:** Evacuate unnecessary personnel.

#### 6.1.2. For Emergency Responders

**Protective Equipment:** Equip cleanup crew with proper protection.

**Emergency Procedures:** Ventilate area.

### 6.2. Environmental Precautions

Prevent entry to sewers and public waters.

### 6.3. Methods and Material for Containment and Cleaning Up

**For Containment:** Contain any spills with dikes or absorbents to prevent migration and entry into sewers or streams.

**Methods for Cleaning Up:** Clear up spills immediately and dispose of waste safely. Absorb and/or contain spill with inert material, then place in suitable container.

### 6.4. Reference to Other Sections

See heading 8, Exposure Controls and Personal Protection.

## SECTION 7: HANDLING AND STORAGE

### 7.1. Precautions for Safe Handling

**Hygiene Measures:** Handle in accordance with good industrial hygiene and safety procedures. Wash hands and other exposed areas with mild soap and water before eating, drinking, or smoking and again when leaving work.

### 7.2. Conditions for Safe Storage, Including Any Incompatibilities

**Technical Measures:** Comply with applicable regulations.

**Storage Conditions:** Store in a dry, cool and well-ventilated place. Keep container closed when not in use. Keep/Store away from extremely high or low temperatures, direct sunlight, incompatible materials.

**Incompatible Products:** Strong acids. Strong bases. Strong oxidizers.

### 7.3. Specific End Use(s)

Theatrical Fog/Haze.

## SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

### 8.1. Control Parameters

No Occupational Exposure Limits (OELs) have been established for this product or its chemical components.

# Backwood Bay - Long Lasting Fog Fluid

## Safety Data Sheet

according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

### 8.2. Exposure Controls

<b>Appropriate Engineering Controls</b>	: Ensure adequate ventilation, especially in confined areas. Ensure all national/local regulations are observed.
<b>Personal Protective Equipment</b>	: Not generally required. The use of personal protective equipment may be necessary as conditions warrant.
<b>Materials for Protective Clothing</b>	: Chemically resistant materials and fabrics.
<b>Hand Protection</b>	: Wear chemically resistant protective gloves.
<b>Eye Protection</b>	: Chemical goggles or safety glasses.
<b>Respiratory Protection</b>	: Use NIOSH-approved air-purifying or supplied-air respirator where airborne concentrations of vapor or mist are expected to exceed exposure limits.
<b>Other Information</b>	: When using, do not eat, drink or smoke.

## SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

### 9.1. Information on Basic Physical and Chemical Properties

<b>Physical State</b>	: Liquid
<b>Appearance</b>	: Clear.
<b>Odor</b>	: Odorless.
<b>Odor Threshold</b>	: No data available
<b>pH</b>	: Unknown
<b>Relative Evaporation Rate (butylacetate=1)</b>	: No data available
<b>Melting Point</b>	: No data available
<b>Freezing Point</b>	: -33°C (-27.4°F)
<b>Boiling Point</b>	: 101 °C (213.8°F)
<b>Flash Point</b>	: Does not flash
<b>Auto-ignition Temperature</b>	: No data available
<b>Decomposition Temperature</b>	: No data available
<b>Flammability (solid, gas)</b>	: No data available
<b>Vapor Pressure</b>	: No data available
<b>Relative Vapor Density at 20 °C</b>	: No data available
<b>Relative Density</b>	: No data available
<b>Specific Gravity</b>	: Not available
<b>Solubility</b>	: Soluble in water.
<b>Log Pow</b>	: No data available
<b>Log Kow</b>	: No data available
<b>Viscosity, Kinematic</b>	: No data available
<b>Viscosity, Dynamic</b>	: No data available
<b>Explosive Properties</b>	: No data available
<b>Oxidizing Properties</b>	: No data available
<b>Explosive Limits</b>	: Not applicable

9.2. **Other Information** No additional information available

## SECTION 10: STABILITY AND REACTIVITY

- 10.1 **Reactivity:** Hazardous reactions will not occur under normal conditions.
- 10.2 **Chemical Stability:** Stable under normal conditions.
- 10.3 **Possibility of Hazardous Reactions:** Hazardous polymerization will not occur.
- 10.4 **Conditions to Avoid:** Direct sunlight. Extremely high or low temperatures. Incompatible materials.
- 10.5 **Incompatible Materials:** Strong acids. Strong bases. Strong oxidizers.
- 10.6 **Hazardous Decomposition Products:** Carbon oxides (CO, CO<sub>2</sub>).

## SECTION 11: TOXICOLOGICAL INFORMATION

### 11.1. Information On Toxicological Effects

**Acute Toxicity** : Not classified

# Backwood Bay - Long Lasting Fog Fluid

## Safety Data Sheet

according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

<b>Water (7732-18-5)</b>	
LC50 Inhalation Rat (ppm)	100000 ppm
<b>1,2-Propylene glycol (57-55-6)</b>	
LD50 Oral Rat	20000 mg/kg
LD50 Dermal Rabbit	20800 mg/kg
<b>Triethylene glycol (112-27-6)</b>	
LD50 Oral Rat	15000 mg/kg
LD50 Dermal Rabbit	> 20 ml/kg

**Skin Corrosion/Irritation:** Not classified

pH: unknown

**Serious Eye Damage/Irritation:** Not classified

pH: unknown

**Respiratory or Skin Sensitization:** Not classified

**Germ Cell Mutagenicity:** Not classified

**Carcinogenicity:** Not classified

**Reproductive Toxicity:** Not classified

**Specific Target Organ Toxicity (Single Exposure):** Not classified

**Specific Target Organ Toxicity (Repeated Exposure):** Not classified

**Aspiration Hazard:** Not classified

**Symptoms/Injuries After Inhalation:** None expected under normal conditions of use.

**Symptoms/Injuries After Skin Contact:** None expected under normal conditions of use.

**Symptoms/Injuries After Eye Contact:** None expected under normal conditions of use.

**Symptoms/Injuries After Ingestion:** None expected under normal conditions of use.

## SECTION 12: ECOLOGICAL INFORMATION

### 12.1. Toxicity

<b>1,2-Propylene glycol (57-55-6)</b>	
LC50 Fish 1	51600 mg/l (Exposure time: 96 h - Species: Oncorhynchus mykiss [static])
EC50 Daphnia 1	10000 mg/l (Exposure time: 24 h - Species: Daphnia magna)
EC50 Other Aquatic Organisms 1	19000 mg/l (Exposure time: 96 h - Species: Pseudokirchneriella subcapitata)
LC 50 Fish 2	41 (41 - 47) mg/l (Exposure time: 96 h - Species: Oncorhynchus mykiss [static])
EC50 Daphnia 2	1000 mg/l (Exposure time: 48 h - Species: Daphnia magna [Static])
<b>Triethylene glycol (112-27-6)</b>	
LC50 Fish 1	56200 - 63700 mg/l (Exposure time: 96 h - Species: Pimephales promelas [flow-through])
EC50 Daphnia 1	42426 mg/l (Exposure time: 48 h - Species: Daphnia magna)
LC 50 Fish 2	10000 mg/l (Exposure time: 96 h - Species: Lepomis macrochirus [static])

### 12.2. Persistence and Degradability

<b>Backwood Bay - Long Lasting Fog Fluid</b>	
Persistence and Degradability	Not established.

### 12.3. Bioaccumulative Potential

<b>Backwood Bay - Long Lasting Fog Fluid</b>	
Bioaccumulative Potential	Not established.

<b>1,2-Propylene glycol (57-55-6)</b>	
BCF fish 1	< 1

<b>Triethylene glycol (112-27-6)</b>	
Log Pow	-1.98 (at 25 °C)

**12.4. Mobility in Soil** No additional information available

### 12.5. Other Adverse Effects

**Other Information** : Avoid release to the environment.

# Backwood Bay - Long Lasting Fog Fluid

Safety Data Sheet

according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

## SECTION 13: DISPOSAL CONSIDERATIONS

### 13.1. Waste treatment methods

**Waste Disposal Recommendations:** Dispose of waste material in accordance with all local, regional, national, and international regulations.

## SECTION 14: TRANSPORT INFORMATION

In Accordance With ICAO/IATA/IMDG/DOT

**14.1. UN Number** Not regulated for transport

**14.2. UN Proper Shipping Name** Not regulated for transport

### 14.3. Additional Information

**Other information** : No supplementary information available.

**Transport by Sea** Not regulated for transport

**Air Transport** Not regulated for transport

## SECTION 15: REGULATORY INFORMATION

### 15.1 US Federal Regulations

<b>Water (7732-18-5)</b>	
Listed on the United States TSCA (Toxic Substances Control Act) inventory	
<b>1,2-Propylene glycol (57-55-6)</b>	
Listed on the United States TSCA (Toxic Substances Control Act) inventory	
<b>EPA TSCA Regulatory Flag</b>	Y2 - Y2 - indicates an exempt polymer that is a polyester and is made only from reactants included in a specified list of low concern reactants that comprises one of the eligibility criteria for the exemption rule.

### Triethylene glycol (112-27-6)

Listed on the United States TSCA (Toxic Substances Control Act) inventory

### 15.2 US State Regulations

<b>1,2-Propylene glycol (57-55-6)</b>
U.S. - Minnesota - Hazardous Substance List U.S. - New Jersey - Right to Know Hazardous Substance List U.S. - Pennsylvania - RTK (Right to Know) List U.S. - Texas - Effects Screening Levels - Long Term U.S. - Texas - Effects Screening Levels - Short Term
<b>Triethylene glycol (112-27-6)</b>
U.S. - Pennsylvania - RTK (Right to Know) List U.S. - Texas - Effects Screening Levels - Long Term U.S. - Texas - Effects Screening Levels - Short Term

## SECTION 16: OTHER INFORMATION

**Revision date** : 10/20/2014

**Other Information** : This document has been prepared in accordance with the SDS requirements of the OSHA Hazard Communication Standard 29 CFR 1910.1200.

*This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product*

SDS US (GHS HazCom) - US





# Base Hazer Liquid

## Special Liquid for the Base Hazer Pro

### Safety Data Sheet

Froggy's Fog LLC  
302 Rutherford Lane  
Columbia, TN 38401  
United States  
Phone: (615) 469-4906

according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 /  
Rules and Regulations

Version: 1.0  
Revision Date: 10/20/2014

#### SECTION 1: IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY

##### 1.1. Product Identifier

Product Form: Mixture

Product Name: Base Hazer Liquid - Special Liquid for the Base Hazer Pro

##### 1.2. Intended Use of the Product

Use of the Substance/Mixture: Theatrical Fog/Haze

##### 1.3. Name, Address, and Telephone of the Responsible Party

Froggy's Fog LLC

302 Rutherford Lane

Columbia, TN 38401

1-615-469-4906

[www.froggysfog.com](http://www.froggysfog.com)

##### 1.4. Emergency Telephone Number

Chemtrec: (800) 424-9300

#### SECTION 2: HAZARDS IDENTIFICATION

##### 2.1. Classification of the Substance or Mixture

Classification (GHS-US)

Not classified

##### 2.2. Label Elements

GHS-US Labeling

No labeling required

##### 2.3. Other Hazards

Other Hazards Not Contributing to the Classification: Exposure may aggravate those with pre-existing eye, skin, or respiratory conditions.

##### 2.4. Unknown Acute Toxicity (GHS-US)

No data available

#### SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

##### 3.1. Substance

Not applicable

##### 3.2. Mixture

Name	Product Identifier	%	Classification (GHS-US)
Water	(CAS No) 7732-18-5	Proprietary	Not classified
Triethylene glycol	(CAS No) 112-27-6	Proprietary	Not classified

The specific chemical identity and/or exact percentage of composition has been withheld as a trade secret.

Full text of H-phrases: see section 16

#### SECTION 4: FIRST AID MEASURES

##### 4.1. Description of First Aid Measures

**First-aid Measures General:** Never give anything by mouth to an unconscious person. If you feel unwell, seek medical advice (show the label where possible).

**First-aid Measures After Inhalation:** When symptoms occur: go into open air and ventilate suspected area. Obtain medical attention if breathing difficulty persists.

**First-aid Measures After Skin Contact:** Remove contaminated clothing. Drench affected area with water for at least 15 minutes. Obtain medical attention if irritation develops or persists.

**First-aid Measures After Eye Contact:** Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Obtain medical attention if pain, blinking or redness persist.

**First-aid Measures After Ingestion:** Rinse mouth. Do NOT induce vomiting. Seek medical attention.

##### 4.2. Most important symptoms and effects, both acute and delayed

**Symptoms/Injuries:** Not expected to present a significant hazard under anticipated conditions of normal use.

# Base Hazer Liquid - Special Liquid for the Base Hazer Pro

## Safety Data Sheet

according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

**Symptoms/Injuries After Inhalation:** None expected under normal conditions of use.

**Symptoms/Injuries After Skin Contact:** None expected under normal conditions of use.

**Symptoms/Injuries After Eye Contact:** None expected under normal conditions of use.

**Symptoms/Injuries After Ingestion:** None expected under normal conditions of use.

### 4.3. Indication of Any Immediate Medical Attention and Special Treatment Needed

If you feel unwell, seek medical advice (show the label where possible).

## SECTION 5: FIREFIGHTING MEASURES

### 5.1. Extinguishing Media

**Suitable Extinguishing Media:** Use extinguishing media appropriate for surrounding fire.

**Unsuitable Extinguishing Media:** Do not use a heavy water stream. Use of heavy stream of water may spread fire.

### 5.2. Special Hazards Arising From the Substance or Mixture

**Fire Hazard:** Not flammable.

**Explosion Hazard:** Product is not explosive.

**Reactivity:** Hazardous reactions will not occur under normal conditions.

### 5.3. Advice for Firefighters

**Precautionary Measures Fire:** Exercise caution when fighting any chemical fire.

**Firefighting Instructions:** Use water spray or fog for cooling exposed containers.

**Protection During Firefighting:** Do not enter fire area without proper protective equipment, including respiratory protection.

**Other information:** Do not allow run-off from fire fighting to enter drains or water courses.

## SECTION 6: ACCIDENTAL RELEASE MEASURES

### 6.1. Personal Precautions, Protective Equipment and Emergency Procedures

**General Measures:** Avoid prolonged contact with eyes, skin and clothing. Avoid breathing (vapors, mist, spray).

#### 6.1.1. For Non-emergency Personnel

**Protective Equipment:** Use appropriate personal protection equipment (PPE).

**Emergency Procedures:** Evacuate unnecessary personnel.

#### 6.1.2. For Emergency Responders

**Protective Equipment:** Equip cleanup crew with proper protection.

**Emergency Procedures:** Ventilate area.

### 6.2. Environmental Precautions

Prevent entry to sewers and public waters.

### 6.3. Methods and Material for Containment and Cleaning Up

**For Containment:** Contain any spills with dikes or absorbents to prevent migration and entry into sewers or streams.

**Methods for Cleaning Up:** Clear up spills immediately and dispose of waste safely. Absorb and/or contain spill with inert material, then place in suitable container.

### 6.4. Reference to Other Sections

See heading 8, Exposure Controls and Personal Protection.

## SECTION 7: HANDLING AND STORAGE

### 7.1. Precautions for Safe Handling

**Hygiene Measures:** Handle in accordance with good industrial hygiene and safety procedures. Wash hands and other exposed areas with mild soap and water before eating, drinking, or smoking and again when leaving work.

### 7.2. Conditions for Safe Storage, Including Any Incompatibilities

**Technical Measures:** Comply with applicable regulations.

**Storage Conditions:** Store in a dry, cool and well-ventilated place. Keep container closed when not in use. Keep/Store away from extremely high or low temperatures, direct sunlight, incompatible materials.

**Incompatible Products:** Strong acids. Strong bases. Strong oxidizers.

### 7.3. Specific End Use(s)

Theatrical Fog/Haze.

## SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

### 8.1. Control Parameters

No Occupational Exposure Limits (OELs) have been established for this product or its chemical components.

# Base Hazer Liquid - Special Liquid for the Base Hazer Pro

## Safety Data Sheet

according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

### 8.2. Exposure Controls

<b>Appropriate Engineering Controls</b>	: Ensure adequate ventilation, especially in confined areas. Ensure all national/local regulations are observed.
<b>Personal Protective Equipment</b>	: Not generally required. The use of personal protective equipment may be necessary as conditions warrant.
<b>Materials for Protective Clothing</b>	: Chemically resistant materials and fabrics.
<b>Hand Protection</b>	: Wear chemically resistant protective gloves.
<b>Eye Protection</b>	: Chemical goggles or safety glasses.
<b>Respiratory Protection</b>	: Use NIOSH-approved air-purifying or supplied-air respirator where airborne concentrations of vapor or mist are expected to exceed exposure limits.
<b>Other Information</b>	: When using, do not eat, drink or smoke.

## SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

### 9.1. Information on Basic Physical and Chemical Properties

<b>Physical State</b>	: Liquid
<b>Appearance</b>	: Clear.
<b>Odor</b>	: Odorless.
<b>Odor Threshold</b>	: No data available
<b>pH</b>	: Unknown
<b>Relative Evaporation Rate (butylacetate=1)</b>	: No data available
<b>Melting Point</b>	: No data available
<b>Freezing Point</b>	: -5°C (23°F)
<b>Boiling Point</b>	: 280-295 °C (536-563°F)
<b>Flash Point</b>	: >135 °C
<b>Auto-ignition Temperature</b>	: 360 °C
<b>Decomposition Temperature</b>	: No data available
<b>Flammability (solid, gas)</b>	: No data available
<b>Vapor Pressure</b>	: No data available
<b>Relative Vapor Density at 20 °C</b>	: No data available
<b>Relative Density</b>	: No data available
<b>Specific Gravity</b>	: 1.07 g/cm <sup>3</sup> (20 °C)
<b>Solubility</b>	: Soluble in water.
<b>Log Pow</b>	: No data available
<b>Log Kow</b>	: No data available
<b>Viscosity, Kinematic</b>	: Ca. 40 mPas (20 °C)
<b>Viscosity, Dynamic</b>	: No data available
<b>Explosive Properties</b>	: No data available
<b>Oxidizing Properties</b>	: No data available
<b>Explosive Limits</b>	: Not applicable

9.2. **Other Information** No additional information available

## SECTION 10: STABILITY AND REACTIVITY

- 10.1 **Reactivity:** Hazardous reactions will not occur under normal conditions.
- 10.2 **Chemical Stability:** Stable under normal conditions.
- 10.3 **Possibility of Hazardous Reactions:** Hazardous polymerization will not occur.
- 10.4 **Conditions to Avoid:** Direct sunlight. Extremely high or low temperatures. Incompatible materials.
- 10.5 **Incompatible Materials:** Strong acids. Strong bases. Strong oxidizers.
- 10.6 **Hazardous Decomposition Products:** Carbon oxides (CO, CO<sub>2</sub>).

## SECTION 11: TOXICOLOGICAL INFORMATION

### 11.1. Information On Toxicological Effects

**Acute Toxicity** : Not classified

# Base Hazer Liquid - Special Liquid for the Base Hazer Pro

## Safety Data Sheet

according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

<b>Water (7732-18-5)</b>	
<b>LC50 Inhalation Rat (ppm)</b>	100000 ppm
<b>Triethylene glycol (112-27-6)</b>	
<b>LD50 Oral Rat</b>	15000 mg/kg
<b>LD50 Dermal Rabbit</b>	> 20 ml/kg

**Skin Corrosion/Irritation:** Not classified

pH: unknown

**Serious Eye Damage/Irritation:** Not classified

pH: unknown

**Respiratory or Skin Sensitization:** Not classified

**Germ Cell Mutagenicity:** Not classified

**Carcinogenicity:** Not classified

**Reproductive Toxicity:** Not classified

**Specific Target Organ Toxicity (Single Exposure):** Not classified

**Specific Target Organ Toxicity (Repeated Exposure):** Not classified

**Aspiration Hazard:** Not classified

**Symptoms/Injuries After Inhalation:** None expected under normal conditions of use.

**Symptoms/Injuries After Skin Contact:** None expected under normal conditions of use.

**Symptoms/Injuries After Eye Contact:** None expected under normal conditions of use.

**Symptoms/Injuries After Ingestion:** None expected under normal conditions of use.

## SECTION 12: ECOLOGICAL INFORMATION

### 12.1. Toxicity

<b>Triethylene glycol (112-27-6)</b>	
<b>LC50 Fish 1</b>	56200 - 63700 mg/l (Exposure time: 96 h - Species: Pimephales promelas [flow-through])
<b>EC50 Daphnia 1</b>	42426 mg/l (Exposure time: 48 h - Species: Daphnia magna)
<b>LC 50 Fish 2</b>	10000 mg/l (Exposure time: 96 h - Species: Lepomis macrochirus [static])

### 12.2. Persistence and Degradability

<b>Base Hazer Liquid - Special Liquid for the Base Hazer Pro</b>	
<b>Persistence and Degradability</b>	Not established.

### 12.3. Bioaccumulative Potential

<b>Base Hazer Liquid - Special Liquid for the Base Hazer Pro</b>	
<b>Bioaccumulative Potential</b>	Not established.

<b>Triethylene glycol (112-27-6)</b>	
<b>Log Pow</b>	-1.98 (at 25 °C)

**12.4. Mobility in Soil** No additional information available

### 12.5. Other Adverse Effects

**Other Information** : Avoid release to the environment.

## SECTION 13: DISPOSAL CONSIDERATIONS

### 13.1. Waste treatment methods

**Waste Disposal Recommendations:** Dispose of waste material in accordance with all local, regional, national, and international regulations.

## SECTION 14: TRANSPORT INFORMATION

In Accordance With ICAO/IATA/IMDG/DOT

**14.1. UN Number** Not regulated for transport

**14.2. UN Proper Shipping Name** Not regulated for transport

### 14.3. Additional Information

**Other information** : No supplementary information available.

# Base Hazer Liquid - Special Liquid for the Base Hazer Pro

Safety Data Sheet

according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

**Transport by Sea** Not regulated for transport

**Air Transport** Not regulated for transport

## SECTION 15: REGULATORY INFORMATION

### 15.1 US Federal Regulations

#### Water (7732-18-5)

Listed on the United States TSCA (Toxic Substances Control Act) inventory

#### Triethylene glycol (112-27-6)

Listed on the United States TSCA (Toxic Substances Control Act) inventory

### 15.2 US State Regulations

#### Triethylene glycol (112-27-6)

U.S. - Pennsylvania - RTK (Right to Know) List

U.S. - Texas - Effects Screening Levels - Long Term

U.S. - Texas - Effects Screening Levels - Short Term

## SECTION 16: OTHER INFORMATION

**Revision date** : 10/20/2014

**Other Information** : This document has been prepared in accordance with the SDS requirements of the OSHA Hazard Communication Standard 29 CFR 1910.1200.

*This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product*

SDS US (GHS HazCom) - US



# Beam Splitter Haze

## Safety Data Sheet

Froggy's Fog LLC  
302 Rutherford Lane  
Columbia, TN 38401  
United States  
Phone: (615) 469-4906

according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

Version: 1.0  
Revision Date: 10/20/2014

### SECTION 1: IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY

#### 1.1. Product Identifier

**Product Form:** Mixture

**Product Name:** Beam Splitter Haze

#### 1.2. Intended Use of the Product

**Use of the Substance/Mixture:** Theatrical Fog/Haze

#### 1.3. Name, Address, and Telephone of the Responsible Party

Froggy's Fog LLC  
302 Rutherford Lane  
Columbia, TN 38401  
1-615-469-4906  
[www.froggysfog.com](http://www.froggysfog.com)

#### 1.4. Emergency Telephone Number

Chemtrec: (800) 424-9300

### SECTION 2: HAZARDS IDENTIFICATION

#### 2.1. Classification of the Substance or Mixture

**Classification (GHS-US)**

Not classified

#### 2.2. Label Elements

**GHS-US Labeling**

No labeling required

#### 2.3. Other Hazards

**Other Hazards Not Contributing to the Classification:** Exposure may aggravate those with pre-existing eye, skin, or respiratory conditions.

#### 2.4. Unknown Acute Toxicity (GHS-US)

No data available

### SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

#### 3.1. Substance

Not applicable

#### 3.2. Mixture

Name	Product Identifier	%	Classification (GHS-US)
Water	(CAS No) 7732-18-5	Proprietary	Not classified
Triethylene glycol	(CAS No) 112-27-6	Proprietary	Not classified
1,2-Propylene glycol	(CAS No) 57-55-6	Proprietary	Not classified

The specific chemical identity and/or exact percentage of composition has been withheld as a trade secret.

Full text of H-phrases: see section 16

### SECTION 4: FIRST AID MEASURES

#### 4.1. Description of First Aid Measures

**First-aid Measures General:** Never give anything by mouth to an unconscious person. If you feel unwell, seek medical advice (show the label where possible).

**First-aid Measures After Inhalation:** When symptoms occur: go into open air and ventilate suspected area. Obtain medical attention if breathing difficulty persists.

**First-aid Measures After Skin Contact:** Remove contaminated clothing. Drench affected area with water for at least 15 minutes. Obtain medical attention if irritation develops or persists.

**First-aid Measures After Eye Contact:** Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Obtain medical attention if pain, blinking or redness persist.

**First-aid Measures After Ingestion:** Rinse mouth. Do NOT induce vomiting. Seek medical attention.

# Beam Splitter Haze

## Safety Data Sheet

according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

### 4.2. Most important symptoms and effects, both acute and delayed

**Symptoms/Injuries:** Not expected to present a significant hazard under anticipated conditions of normal use.

**Symptoms/Injuries After Inhalation:** None expected under normal conditions of use.

**Symptoms/Injuries After Skin Contact:** None expected under normal conditions of use.

**Symptoms/Injuries After Eye Contact:** None expected under normal conditions of use.

**Symptoms/Injuries After Ingestion:** None expected under normal conditions of use.

### 4.3. Indication of Any Immediate Medical Attention and Special Treatment Needed

If you feel unwell, seek medical advice (show the label where possible).

## SECTION 5: FIREFIGHTING MEASURES

### 5.1. Extinguishing Media

**Suitable Extinguishing Media:** Use extinguishing media appropriate for surrounding fire.

**Unsuitable Extinguishing Media:** Do not use a heavy water stream. Use of heavy stream of water may spread fire.

### 5.2. Special Hazards Arising From the Substance or Mixture

**Fire Hazard:** Not flammable.

**Explosion Hazard:** Product is not explosive.

**Reactivity:** Hazardous reactions will not occur under normal conditions.

### 5.3. Advice for Firefighters

**Precautionary Measures Fire:** Exercise caution when fighting any chemical fire.

**Firefighting Instructions:** Use water spray or fog for cooling exposed containers.

**Protection During Firefighting:** Do not enter fire area without proper protective equipment, including respiratory protection.

**Other information:** Do not allow the product to be released into the environment. Do not allow run-off from fire fighting to enter drains or water courses.

## SECTION 6: ACCIDENTAL RELEASE MEASURES

### 6.1. Personal Precautions, Protective Equipment and Emergency Procedures

**General Measures:** Avoid prolonged contact with eyes, skin and clothing. Avoid breathing (vapors, mist, spray).

#### 6.1.1. For Non-emergency Personnel

**Protective Equipment:** Use appropriate personal protection equipment (PPE).

**Emergency Procedures:** Evacuate unnecessary personnel.

#### 6.1.2. For Emergency Responders

**Protective Equipment:** Equip cleanup crew with proper protection.

**Emergency Procedures:** Ventilate area.

### 6.2. Environmental Precautions

Prevent entry to sewers and public waters.

### 6.3. Methods and Material for Containment and Cleaning Up

**For Containment:** Contain any spills with dikes or absorbents to prevent migration and entry into sewers or streams.

**Methods for Cleaning Up:** Clear up spills immediately and dispose of waste safely. Absorb and/or contain spill with inert material, then place in suitable container.

### 6.4. Reference to Other Sections

See heading 8, Exposure Controls and Personal Protection.

## SECTION 7: HANDLING AND STORAGE

### 7.1. Precautions for Safe Handling

**Hygiene Measures:** Handle in accordance with good industrial hygiene and safety procedures. Wash hands and other exposed areas with mild soap and water before eating, drinking, or smoking and again when leaving work.

### 7.2. Conditions for Safe Storage, Including Any Incompatibilities

**Technical Measures:** Comply with applicable regulations.

**Storage Conditions:** Store in a dry, cool and well-ventilated place. Keep container closed when not in use. Keep/Store away from extremely high or low temperatures, direct sunlight, incompatible materials.

**Incompatible Products:** Strong acids. Strong bases. Strong oxidizers.

### 7.3. Specific End Use(s)

Theatrical Fog/Haze.

# Beam Splitter Haze

Safety Data Sheet

according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

## SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

### 8.1. Control Parameters

No Occupational Exposure Limits (OELs) have been established for this product or its chemical components.

### 8.2. Exposure Controls

<b>Appropriate Engineering Controls</b>	: Ensure adequate ventilation, especially in confined areas. Ensure all national/local regulations are observed.
<b>Personal Protective Equipment</b>	: Not generally required. The use of personal protective equipment may be necessary as conditions warrant.
<b>Materials for Protective Clothing</b>	: Chemically resistant materials and fabrics.
<b>Hand Protection</b>	: Wear chemically resistant protective gloves.
<b>Eye Protection</b>	: Chemical goggles or safety glasses.
<b>Respiratory Protection</b>	: Use NIOSH-approved air-purifying or supplied-air respirator where airborne concentrations of vapor or mist are expected to exceed exposure limits.
<b>Other Information</b>	: When using, do not eat, drink or smoke.

## SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

### 9.1. Information on Basic Physical and Chemical Properties

<b>Physical State</b>	: Liquid
<b>Appearance</b>	: Clear.
<b>Odor</b>	: Odorless.
<b>Odor Threshold</b>	: No data available
<b>pH</b>	: Unknown
<b>Relative Evaporation Rate (butylacetate=1)</b>	: No data available
<b>Melting Point</b>	: No data available
<b>Freezing Point</b>	: -19°C (-2.2°F)
<b>Boiling Point</b>	: 99 °C (210.2°F)
<b>Flash Point</b>	: Does not flash
<b>Auto-ignition Temperature</b>	: No data available
<b>Decomposition Temperature</b>	: No data available
<b>Flammability (solid, gas)</b>	: No data available
<b>Vapor Pressure</b>	: No data available
<b>Relative Vapor Density at 20 °C</b>	: No data available
<b>Relative Density</b>	: No data available
<b>Specific Gravity</b>	: Not available
<b>Solubility</b>	: Soluble in water.
<b>Log Pow</b>	: No data available
<b>Log Kow</b>	: No data available
<b>Viscosity, Kinematic</b>	: No data available
<b>Viscosity, Dynamic</b>	: No data available
<b>Explosive Properties</b>	: No data available
<b>Oxidizing Properties</b>	: No data available
<b>Explosive Limits</b>	: Not applicable

### 9.2. Other Information

No additional information available

## SECTION 10: STABILITY AND REACTIVITY

- 10.1 Reactivity:** Hazardous reactions will not occur under normal conditions.
- 10.2 Chemical Stability:** Stable under normal conditions.
- 10.3 Possibility of Hazardous Reactions:** Hazardous polymerization will not occur.
- 10.4 Conditions to Avoid:** Direct sunlight. Extremely high or low temperatures. Incompatible materials.
- 10.5 Incompatible Materials:** Strong acids. Strong bases. Strong oxidizers.
- 10.6 Hazardous Decomposition Products:** Carbon oxides (CO, CO<sub>2</sub>).



# Beam Splitter Haze

Safety Data Sheet

according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

## SECTION 11: TOXICOLOGICAL INFORMATION

### 11.1. Information On Toxicological Effects

Acute Toxicity : Not classified

<b>Water (7732-18-5)</b>	
LC50 Inhalation Rat (ppm)	100000 ppm
<b>1,2-Propylene glycol (57-55-6)</b>	
LD50 Oral Rat	20000 mg/kg
LD50 Dermal Rabbit	20800 mg/kg
<b>Triethylene glycol (112-27-6)</b>	
LD50 Oral Rat	15000 mg/kg
LD50 Dermal Rabbit	> 20 ml/kg

Skin Corrosion/Irritation: Not classified

pH: unknown

Serious Eye Damage/Irritation: Not classified

pH: unknown

Respiratory or Skin Sensitization: Not classified

Germ Cell Mutagenicity: Not classified

Carcinogenicity: Not classified

Reproductive Toxicity: Not classified

Specific Target Organ Toxicity (Single Exposure): Not classified

Specific Target Organ Toxicity (Repeated Exposure): Not classified

Aspiration Hazard: Not classified

Symptoms/Injuries After Inhalation: None expected under normal conditions of use.

Symptoms/Injuries After Skin Contact: None expected under normal conditions of use.

Symptoms/Injuries After Eye Contact: None expected under normal conditions of use.

Symptoms/Injuries After Ingestion: None expected under normal conditions of use.

## SECTION 12: ECOLOGICAL INFORMATION

### 12.1. Toxicity

<b>1,2-Propylene glycol (57-55-6)</b>	
LC50 Fish 1	51600 mg/l (Exposure time: 96 h - Species: Oncorhynchus mykiss [static])
EC50 Daphnia 1	10000 mg/l (Exposure time: 24 h - Species: Daphnia magna)
EC50 Other Aquatic Organisms 1	19000 mg/l (Exposure time: 96 h - Species: Pseudokirchneriella subcapitata)
LC 50 Fish 2	41 (41 - 47) mg/l (Exposure time: 96 h - Species: Oncorhynchus mykiss [static])
EC50 Daphnia 2	1000 mg/l (Exposure time: 48 h - Species: Daphnia magna [Static])

<b>Triethylene glycol (112-27-6)</b>	
LC50 Fish 1	56200 - 63700 mg/l (Exposure time: 96 h - Species: Pimephales promelas [flow-through])
EC50 Daphnia 1	42426 mg/l (Exposure time: 48 h - Species: Daphnia magna)
LC 50 Fish 2	10000 mg/l (Exposure time: 96 h - Species: Lepomis macrochirus [static])

### 12.2. Persistence and Degradability

<b>Beam Splitter Haze</b>	
Persistence and Degradability	Not established.

### 12.3. Bioaccumulative Potential

<b>Beam Splitter Haze</b>	
Bioaccumulative Potential	Not established.

<b>1,2-Propylene glycol (57-55-6)</b>	
BCF fish 1	< 1

<b>Triethylene glycol (112-27-6)</b>	
Log Pow	-1.98 (at 25 °C)

12.4. Mobility in Soil No additional information available

# Beam Splitter Haze

Safety Data Sheet

according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

## 12.5. Other Adverse Effects

**Other Information** : Avoid release to the environment.

## SECTION 13: DISPOSAL CONSIDERATIONS

### 13.1. Waste treatment methods

**Waste Disposal Recommendations:** Dispose of waste material in accordance with all local, regional, national, and international regulations.

## SECTION 14: TRANSPORT INFORMATION

In Accordance With ICAO/IATA/IMDG/DOT

**14.1. UN Number** Not regulated for transport

**14.2. UN Proper Shipping Name** Not regulated for transport

### 14.3. Additional Information

**Other information** : No supplementary information available.

**Transport by Sea** Not regulated for transport

**Air Transport** Not regulated for transport

## SECTION 15: REGULATORY INFORMATION

### 15.1 US Federal Regulations

#### Water (7732-18-5)

Listed on the United States TSCA (Toxic Substances Control Act) inventory

#### 1,2-Propylene glycol (57-55-6)

Listed on the United States TSCA (Toxic Substances Control Act) inventory

#### EPA TSCA Regulatory Flag

Y2 - Y2 - indicates an exempt polymer that is a polyester and is made only from reactants included in a specified list of low concern reactants that comprises one of the eligibility criteria for the exemption rule.

#### Triethylene glycol (112-27-6)

Listed on the United States TSCA (Toxic Substances Control Act) inventory

### 15.2 US State Regulations

#### 1,2-Propylene glycol (57-55-6)

U.S. - Minnesota - Hazardous Substance List  
U.S. - New Jersey - Right to Know Hazardous Substance List  
U.S. - Pennsylvania - RTK (Right to Know) List  
U.S. - Texas - Effects Screening Levels - Long Term  
U.S. - Texas - Effects Screening Levels - Short Term

#### Triethylene glycol (112-27-6)

U.S. - Pennsylvania - RTK (Right to Know) List  
U.S. - Texas - Effects Screening Levels - Long Term  
U.S. - Texas - Effects Screening Levels - Short Term

## SECTION 16: OTHER INFORMATION

**Revision date** : 10/20/2014

**Other Information** : This document has been prepared in accordance with the SDS requirements of the OSHA Hazard Communication Standard 29 CFR 1910.1200.

*This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product*

SDS US (GHS HazCom) - US



# Bog Fog

## Extreme Density Fog Fluid

### Safety Data Sheet

Froggy's Fog LLC  
302 Rutherford Lane  
Columbia, TN 38401  
United States  
Phone: (615) 469-4906

according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

Version: 1.0  
Revision Date: 10/20/2014

#### SECTION 1: IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY

##### 1.1. Product Identifier

**Product Name:** Bog Fog – Extreme Density Fog Fluid

##### 1.2. Intended Use of the Product

**Use of the Substance/Mixture:** Theatrical Fog/Haze

##### 1.3. Name, Address, and Telephone of the Responsible Party

Froggy's Fog LLC  
302 Rutherford Lane  
Columbia, TN 38401  
1-615-469-4906  
[www.froggysfog.com](http://www.froggysfog.com)

##### 1.4. Emergency Telephone Number

Chemtrec: (800) 424-9300

#### SECTION 2: HAZARDS IDENTIFICATION

##### 2.1. Classification of the Substance or Mixture

**Classification (GHS-US)**

Not classified

##### 2.2. Label Elements

**GHS-US Labeling**

No labeling required

##### 2.3. Other Hazards

**Other Hazards Not Contributing to the Classification:** Exposure may aggravate those with pre-existing eye, skin, or respiratory conditions.

##### 2.4. Unknown Acute Toxicity (GHS-US)

No data available

#### SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

##### 3.1. Substance

Not applicable

##### 3.2. Mixture

Name	Product Identifier	%	Classification (GHS-US)
Water	(CAS No) 7732-18-5	Proprietary	Not classified
Triethylene glycol	(CAS No) 112-27-6	Proprietary	Not classified
1,2-Propylene glycol	(CAS No) 57-55-6	Proprietary	Not classified

The specific chemical identity and/or exact percentage of composition has been withheld as a trade secret.

Full text of H-phrases: see section 16

#### SECTION 4: FIRST AID MEASURES

##### 4.1. Description of First Aid Measures

**First-aid Measures General:** Never give anything by mouth to an unconscious person. If you feel unwell, seek medical advice (show the label where possible).

**First-aid Measures After Inhalation:** When symptoms occur: go into open air and ventilate suspected area. Obtain medical attention if breathing difficulty persists.

**First-aid Measures After Skin Contact:** Remove contaminated clothing. Drench affected area with water for at least 15 minutes. Obtain medical attention if irritation develops or persists.

**First-aid Measures After Eye Contact:** Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Obtain medical attention if pain, blinking or redness persist.

**First-aid Measures After Ingestion:** Rinse mouth. Do NOT induce vomiting. Seek medical attention.

# Bog Fog – Extreme Density Fog Fluid

## Safety Data Sheet

according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

### 4.2. Most important symptoms and effects, both acute and delayed

**Symptoms/Injuries:** Not expected to present a significant hazard under anticipated conditions of normal use.

**Symptoms/Injuries After Inhalation:** None expected under normal conditions of use.

**Symptoms/Injuries After Skin Contact:** None expected under normal conditions of use.

**Symptoms/Injuries After Eye Contact:** None expected under normal conditions of use.

**Symptoms/Injuries After Ingestion:** None expected under normal conditions of use.

### 4.3. Indication of Any Immediate Medical Attention and Special Treatment Needed

If you feel unwell, seek medical advice (show the label where possible).

## SECTION 5: FIREFIGHTING MEASURES

### 5.1. Extinguishing Media

**Suitable Extinguishing Media:** Use extinguishing media appropriate for surrounding fire.

**Unsuitable Extinguishing Media:** Do not use a heavy water stream. Use of heavy stream of water may spread fire.

### 5.2. Special Hazards Arising From the Substance or Mixture

**Fire Hazard:** Not flammable.

**Explosion Hazard:** Product is not explosive.

**Reactivity:** Hazardous reactions will not occur under normal conditions.

### 5.3. Advice for Firefighters

**Precautionary Measures Fire:** Exercise caution when fighting any chemical fire.

**Firefighting Instructions:** Use water spray or fog for cooling exposed containers.

**Protection During Firefighting:** Do not enter fire area without proper protective equipment, including respiratory protection.

**Other information:** Do not allow the product to be released into the environment. Do not allow run-off from fire fighting to enter drains or water courses.

## SECTION 6: ACCIDENTAL RELEASE MEASURES

### 6.1. Personal Precautions, Protective Equipment and Emergency Procedures

**General Measures:** Avoid prolonged contact with eyes, skin and clothing. Avoid breathing (vapors, mist, spray).

#### 6.1.1. For Non-emergency Personnel

**Protective Equipment:** Use appropriate personal protection equipment (PPE).

**Emergency Procedures:** Evacuate unnecessary personnel.

#### 6.1.2. For Emergency Responders

**Protective Equipment:** Equip cleanup crew with proper protection.

**Emergency Procedures:** Ventilate area.

### 6.2. Environmental Precautions

Prevent entry to sewers and public waters.

### 6.3. Methods and Material for Containment and Cleaning Up

**For Containment:** Contain any spills with dikes or absorbents to prevent migration and entry into sewers or streams.

**Methods for Cleaning Up:** Clear up spills immediately and dispose of waste safely. Absorb and/or contain spill with inert material, then place in suitable container.

### 6.4. Reference to Other Sections

See heading 8, Exposure Controls and Personal Protection.

## SECTION 7: HANDLING AND STORAGE

### 7.1. Precautions for Safe Handling

**Hygiene Measures:** Handle in accordance with good industrial hygiene and safety procedures. Wash hands and other exposed areas with mild soap and water before eating, drinking, or smoking and again when leaving work.

### 7.2. Conditions for Safe Storage, Including Any Incompatibilities

**Technical Measures:** Comply with applicable regulations.

**Storage Conditions:** Store in a dry, cool and well-ventilated place. Keep container closed when not in use. Keep/Store away from extremely high or low temperatures, direct sunlight, incompatible materials.

**Incompatible Products:** Strong acids. Strong bases. Strong oxidizers.

### 7.3. Specific End Use(s)

Theatrical Fog/Haze.

# Bog Fog – Extreme Density Fog Fluid

Safety Data Sheet

according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

## SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

### 8.1. Control Parameters

No Occupational Exposure Limits (OELs) have been established for this product or its chemical components.

### 8.2. Exposure Controls

<b>Appropriate Engineering Controls</b>	: Ensure adequate ventilation, especially in confined areas. Ensure all national/local regulations are observed.
<b>Personal Protective Equipment</b>	: Not generally required. The use of personal protective equipment may be necessary as conditions warrant.
<b>Materials for Protective Clothing</b>	: Chemically resistant materials and fabrics.
<b>Hand Protection</b>	: Wear chemically resistant protective gloves.
<b>Eye Protection</b>	: Chemical goggles or safety glasses.
<b>Respiratory Protection</b>	: Use NIOSH-approved air-purifying or supplied-air respirator where airborne concentrations of vapor or mist are expected to exceed exposure limits.
<b>Other Information</b>	: When using, do not eat, drink or smoke.

## SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

### 9.1. Information on Basic Physical and Chemical Properties

<b>Physical State</b>	: Liquid
<b>Appearance</b>	: Clear.
<b>Odor</b>	: Odorless.
<b>Odor Threshold</b>	: No data available
<b>pH</b>	: Unknown
<b>Relative Evaporation Rate (butylacetate=1)</b>	: No data available
<b>Melting Point</b>	: No data available
<b>Freezing Point</b>	: -8°C (17.6°F)
<b>Boiling Point</b>	: 105 °C (221°F)
<b>Flash Point</b>	: Does not flash
<b>Auto-ignition Temperature</b>	: No data available
<b>Decomposition Temperature</b>	: No data available
<b>Flammability (solid, gas)</b>	: No data available
<b>Vapor Pressure</b>	: No data available
<b>Relative Vapor Density at 20 °C</b>	: No data available
<b>Relative Density</b>	: No data available
<b>Specific Gravity</b>	: Not available
<b>Solubility</b>	: Soluble in water.
<b>Log Pow</b>	: No data available
<b>Log Kow</b>	: No data available
<b>Viscosity, Kinematic</b>	: No data available
<b>Viscosity, Dynamic</b>	: No data available
<b>Explosive Properties</b>	: No data available
<b>Oxidizing Properties</b>	: No data available
<b>Explosive Limits</b>	: Not applicable

### 9.2. Other Information

No additional information available

## SECTION 10: STABILITY AND REACTIVITY

- 10.1 Reactivity:** Hazardous reactions will not occur under normal conditions.
- 10.2 Chemical Stability:** Stable under normal conditions.
- 10.3 Possibility of Hazardous Reactions:** Hazardous polymerization will not occur.
- 10.4 Conditions to Avoid:** Direct sunlight. Extremely high or low temperatures. Incompatible materials.
- 10.5 Incompatible Materials:** Strong acids. Strong bases. Strong oxidizers.
- 10.6 Hazardous Decomposition Products:** Carbon oxides (CO, CO<sub>2</sub>).

# Bog Fog – Extreme Density Fog Fluid

Safety Data Sheet

according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

## SECTION 11: TOXICOLOGICAL INFORMATION

### 11.1. Information On Toxicological Effects

Acute Toxicity : Not classified

<b>Water (7732-18-5)</b>	
LC50 Inhalation Rat (ppm)	100000 ppm
<b>1,2-Propylene glycol (57-55-6)</b>	
LD50 Oral Rat	20000 mg/kg
LD50 Dermal Rabbit	20800 mg/kg
<b>Triethylene glycol (112-27-6)</b>	
LD50 Oral Rat	15000 mg/kg
LD50 Dermal Rabbit	> 20 ml/kg

Skin Corrosion/Irritation: Not classified

pH: unknown

Serious Eye Damage/Irritation: Not classified

pH: unknown

Respiratory or Skin Sensitization: Not classified

Germ Cell Mutagenicity: Not classified

Carcinogenicity: Not classified

Reproductive Toxicity: Not classified

Specific Target Organ Toxicity (Single Exposure): Not classified

Specific Target Organ Toxicity (Repeated Exposure): Not classified

Aspiration Hazard: Not classified

Symptoms/Injuries After Inhalation: None expected under normal conditions of use.

Symptoms/Injuries After Skin Contact: None expected under normal conditions of use.

Symptoms/Injuries After Eye Contact: None expected under normal conditions of use.

Symptoms/Injuries After Ingestion: None expected under normal conditions of use.

## SECTION 12: ECOLOGICAL INFORMATION

### 12.1. Toxicity

<b>1,2-Propylene glycol (57-55-6)</b>	
LC50 Fish 1	51600 mg/l (Exposure time: 96 h - Species: Oncorhynchus mykiss [static])
EC50 Daphnia 1	10000 mg/l (Exposure time: 24 h - Species: Daphnia magna)
EC50 Other Aquatic Organisms 1	19000 mg/l (Exposure time: 96 h - Species: Pseudokirchneriella subcapitata)
LC 50 Fish 2	41 (41 - 47) mg/l (Exposure time: 96 h - Species: Oncorhynchus mykiss [static])
EC50 Daphnia 2	1000 mg/l (Exposure time: 48 h - Species: Daphnia magna [Static])

<b>Triethylene glycol (112-27-6)</b>	
LC50 Fish 1	56200 - 63700 mg/l (Exposure time: 96 h - Species: Pimephales promelas [flow-through])
EC50 Daphnia 1	42426 mg/l (Exposure time: 48 h - Species: Daphnia magna)
LC 50 Fish 2	10000 mg/l (Exposure time: 96 h - Species: Lepomis macrochirus [static])

### 12.2. Persistence and Degradability

<b>Bog Fog – Extreme Density Fog Fluid</b>	
Persistence and Degradability	Not established.

### 12.3. Bioaccumulative Potential

<b>Bog Fog – Extreme Density Fog Fluid</b>	
Bioaccumulative Potential	Not established.

<b>1,2-Propylene glycol (57-55-6)</b>	
BCF fish 1	< 1

<b>Triethylene glycol (112-27-6)</b>	
Log Pow	-1.98 (at 25 °C)

12.4. Mobility in Soil No additional information available

# Bog Fog – Extreme Density Fog Fluid

Safety Data Sheet

according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

## 12.5. Other Adverse Effects

**Other Information** : Avoid release to the environment.

## SECTION 13: DISPOSAL CONSIDERATIONS

### 13.1. Waste treatment methods

**Waste Disposal Recommendations:** Dispose of waste material in accordance with all local, regional, national, and international regulations.

## SECTION 14: TRANSPORT INFORMATION

In Accordance With ICAO/IATA/IMDG/DOT

**14.1. UN Number** Not regulated for transport

**14.2. UN Proper Shipping Name** Not regulated for transport

### 14.3. Additional Information

**Other information** : No supplementary information available.

**Transport by Sea** Not regulated for transport

**Air Transport** Not regulated for transport

## SECTION 15: REGULATORY INFORMATION

### 15.1 US Federal Regulations

#### Water (7732-18-5)

Listed on the United States TSCA (Toxic Substances Control Act) inventory

#### 1,2-Propylene glycol (57-55-6)

Listed on the United States TSCA (Toxic Substances Control Act) inventory

#### EPA TSCA Regulatory Flag

Y2 - Y2 - indicates an exempt polymer that is a polyester and is made only from reactants included in a specified list of low concern reactants that comprises one of the eligibility criteria for the exemption rule.

#### Triethylene glycol (112-27-6)

Listed on the United States TSCA (Toxic Substances Control Act) inventory

### 15.2 US State Regulations

#### 1,2-Propylene glycol (57-55-6)

U.S. - Minnesota - Hazardous Substance List  
U.S. - New Jersey - Right to Know Hazardous Substance List  
U.S. - Pennsylvania - RTK (Right to Know) List  
U.S. - Texas - Effects Screening Levels - Long Term  
U.S. - Texas - Effects Screening Levels - Short Term

#### Triethylene glycol (112-27-6)

U.S. - Pennsylvania - RTK (Right to Know) List  
U.S. - Texas - Effects Screening Levels - Long Term  
U.S. - Texas - Effects Screening Levels - Short Term

## SECTION 16: OTHER INFORMATION

**Revision date** : 10/20/2014

**Other Information** : This document has been prepared in accordance with the SDS requirements of the OSHA Hazard Communication Standard 29 CFR 1910.1200.

*This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product*

SDS US (GHS HazCom) - US



# Cryo Freeze

## Low Lying Fog Fluid

### Safety Data Sheet

Froggy's Fog LLC  
302 Rutherford Lane  
Columbia, TN 38401  
United States  
Phone: (615) 469-4906

according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

Version: 1.0  
Revision Date: 10/20/2014

## SECTION 1: IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY

### 1.1. Product Identifier

**Product Form:** Mixture

**Product Name:** Cryo Freeze – Low Lying Fog Fluid

### 1.2. Intended Use of the Product

**Use of the Substance/Mixture:** Theatrical Fog/Haze

### 1.3. Name, Address, and Telephone of the Responsible Party

Froggy's Fog LLC  
302 Rutherford Lane  
Columbia, TN 38401  
1-615-469-4906

[www.froggysfog.com](http://www.froggysfog.com)

### 1.4. Emergency Telephone Number

Chemtrec: (800) 424-9300

## SECTION 2: HAZARDS IDENTIFICATION

### 2.1. Classification of the Substance or Mixture

**Classification (GHS-US)**

Not classified

### 2.2. Label Elements

**GHS-US Labeling**

No labeling required

### 2.3. Other Hazards

**Other Hazards Not Contributing to the Classification:** Exposure may aggravate those with pre-existing eye, skin, or respiratory conditions.

### 2.4. Unknown Acute Toxicity (GHS-US)

No data available

## SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

### 3.1. Substance

Not applicable

### 3.2. Mixture

Name	Product Identifier	%	Classification (GHS-US)
Water	(CAS No) 7732-18-5	Proprietary	Not classified
1,2-Propylene glycol	(CAS No) 57-55-6	Proprietary	Not classified

The specific chemical identity and/or exact percentage of composition has been withheld as a trade secret.

Full text of H-phrases: see section 16

## SECTION 4: FIRST AID MEASURES

### 4.1. Description of First Aid Measures

**First-aid Measures General:** Never give anything by mouth to an unconscious person. If you feel unwell, seek medical advice (show the label where possible).

**First-aid Measures After Inhalation:** If symptoms occur: go into open air and ventilate suspected area. Obtain medical attention if breathing difficulty persists.

**First-aid Measures After Skin Contact:** Remove contaminated clothing. Drench affected area with water for at least 15 minutes. Obtain medical attention if irritation develops or persists.

**First-aid Measures After Eye Contact:** Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Obtain medical attention if pain, blinking or redness persists.

**First-aid Measures After Ingestion:** Rinse mouth. Do NOT induce vomiting. Seek medical attention.



# Cryo Freeze – Low Lying Fog Fluid

## Safety Data Sheet

according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

### 4.2. Most important symptoms and effects, both acute and delayed

**Symptoms/Injuries:** Not expected to present a significant hazard under anticipated conditions of normal use.

**Symptoms/Injuries After Inhalation:** None expected under normal conditions of use.

**Symptoms/Injuries After Skin Contact:** None expected under normal conditions of use.

**Symptoms/Injuries After Eye Contact:** None expected under normal conditions of use.

**Symptoms/Injuries After Ingestion:** None expected under normal conditions of use.

### 4.3. Indication of Any Immediate Medical Attention and Special Treatment Needed

If you feel unwell, seek medical advice (show the label where possible).

## SECTION 5: FIREFIGHTING MEASURES

### 5.1. Extinguishing Media

**Suitable Extinguishing Media:** Use extinguishing media appropriate for surrounding fire.

**Unsuitable Extinguishing Media:** Do not use a heavy water stream. Use of heavy stream of water may spread fire.

### 5.2. Special Hazards Arising From the Substance or Mixture

**Fire Hazard:** Not flammable.

**Explosion Hazard:** Product is not explosive.

**Reactivity:** Hazardous reactions will not occur under normal conditions.

### 5.3. Advice for Firefighters

**Precautionary Measures Fire:** Exercise caution when fighting any chemical fire.

**Firefighting Instructions:** Use water spray or fog for cooling exposed containers.

**Protection During Firefighting:** Do not enter fire area without proper protective equipment, including respiratory protection.

**Other information:** Do not allow the product to be released into the environment. Do not allow run-off from fire fighting to enter drains or water courses.

## SECTION 6: ACCIDENTAL RELEASE MEASURES

### 6.1. Personal Precautions, Protective Equipment and Emergency Procedures

**General Measures:** Avoid prolonged contact with eyes, skin and clothing. Avoid breathing (vapors, mist, spray).

#### 6.1.1. For Non-emergency Personnel

**Protective Equipment:** Use appropriate personal protection equipment (PPE).

**Emergency Procedures:** Evacuate unnecessary personnel.

#### 6.1.2. For Emergency Responders

**Protective Equipment:** Equip cleanup crew with proper protection.

**Emergency Procedures:** Ventilate area.

### 6.2. Environmental Precautions

Prevent entry to sewers and public waters.

### 6.3. Methods and Material for Containment and Cleaning Up

**For Containment:** Contain any spills with dikes or absorbents to prevent migration and entry into sewers or streams.

**Methods for Cleaning Up:** Clear up spills immediately and dispose of waste safely. Absorb and/or contain spill with inert material, then place in suitable container.

### 6.4. Reference to Other Sections

See heading 8, Exposure Controls and Personal Protection.

## SECTION 7: HANDLING AND STORAGE

### 7.1. Precautions for Safe Handling

**Hygiene Measures:** Handle in accordance with good industrial hygiene and safety procedures. Wash hands and other exposed areas with mild soap and water before eating, drinking, or smoking and again when leaving work.

### 7.2. Conditions for Safe Storage, Including Any Incompatibilities

**Technical Measures:** Comply with applicable regulations.

**Storage Conditions:** Store in a dry, cool and well-ventilated place. Keep container closed when not in use. Keep/Store away from extremely high or low temperatures, direct sunlight, incompatible materials.

**Incompatible Products:** Strong acids. Strong bases. Strong oxidizers.

### 7.3. Specific End Use(s)

Theatrical Fog/Haze.

# Cryo Freeze – Low Lying Fog Fluid

Safety Data Sheet

according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

## SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

### 8.1. Control Parameters

No Occupational Exposure Limits (OELs) have been established for this product or its chemical components.

### 8.2. Exposure Controls

<b>Appropriate Engineering Controls</b>	: Ensure adequate ventilation, especially in confined areas. Ensure all national/local regulations are observed.
<b>Personal Protective Equipment</b>	: Not generally required. The use of personal protective equipment may be necessary as conditions warrant.
<b>Materials for Protective Clothing</b>	: Chemically resistant materials and fabrics.
<b>Hand Protection</b>	: Wear chemically resistant protective gloves.
<b>Eye Protection</b>	: Chemical goggles or safety glasses.
<b>Respiratory Protection</b>	: Use NIOSH-approved air-purifying or supplied-air respirator where airborne concentrations of vapor or mist are expected to exceed exposure limits.
<b>Other Information</b>	: When using, do not eat, drink or smoke.

## SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

### 9.1. Information on Basic Physical and Chemical Properties

<b>Physical State</b>	: Liquid
<b>Appearance</b>	: Clear.
<b>Odor</b>	: Odorless.
<b>Odor Threshold</b>	: No data available
<b>pH</b>	: Unknown
<b>Relative Evaporation Rate (butylacetate=1)</b>	: No data available
<b>Melting Point</b>	: No data available
<b>Freezing Point</b>	: No data available
<b>Boiling Point</b>	: 100 °C (212°F)
<b>Flash Point</b>	: Does not flash
<b>Auto-ignition Temperature</b>	: No data available
<b>Decomposition Temperature</b>	: No data available
<b>Flammability (solid, gas)</b>	: No data available
<b>Vapor Pressure</b>	: No data available
<b>Relative Vapor Density at 20 °C</b>	: No data available
<b>Relative Density</b>	: No data available
<b>Specific Gravity</b>	: Not available
<b>Solubility</b>	: Soluble in water.
<b>Log Pow</b>	: No data available
<b>Log Kow</b>	: No data available
<b>Viscosity, Kinematic</b>	: No data available
<b>Viscosity, Dynamic</b>	: No data available
<b>Explosive Properties</b>	: No data available
<b>Oxidizing Properties</b>	: No data available
<b>Explosive Limits</b>	: Not applicable

### 9.2. Other Information

No additional information available

## SECTION 10: STABILITY AND REACTIVITY

- 10.1 Reactivity:** Hazardous reactions will not occur under normal conditions.
- 10.2 Chemical Stability:** Stable under normal conditions.
- 10.3 Possibility of Hazardous Reactions:** Hazardous polymerization will not occur.
- 10.4 Conditions to Avoid:** Direct sunlight. Extremely high or low temperatures. Incompatible materials.
- 10.5 Incompatible Materials:** Strong acids. Strong bases. Strong oxidizers.
- 10.6 Hazardous Decomposition Products:** Carbon oxides (CO, CO<sub>2</sub>).

# Cryo Freeze – Low Lying Fog Fluid

## Safety Data Sheet

according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

### SECTION 11: TOXICOLOGICAL INFORMATION

#### 11.1. Information On Toxicological Effects

Acute Toxicity : Not classified

<b>Water (7732-18-5)</b>	
LC50 Inhalation Rat (ppm)	100000 ppm
<b>1,2-Propylene glycol (57-55-6)</b>	
LD50 Oral Rat	20000 mg/kg
LD50 Dermal Rabbit	20800 mg/kg

**Skin Corrosion/Irritation:** Not classified

pH: unknown

**Serious Eye Damage/Irritation:** Not classified

pH: unknown

**Respiratory or Skin Sensitization:** Not classified

**Germ Cell Mutagenicity:** Not classified

**Carcinogenicity:** Not classified

**Reproductive Toxicity:** Not classified

**Specific Target Organ Toxicity (Single Exposure):** Not classified

**Specific Target Organ Toxicity (Repeated Exposure):** Not classified

**Aspiration Hazard:** Not classified

**Symptoms/Injuries After Inhalation:** None expected under normal conditions of use.

**Symptoms/Injuries After Skin Contact:** None expected under normal conditions of use.

**Symptoms/Injuries After Eye Contact:** None expected under normal conditions of use.

**Symptoms/Injuries After Ingestion:** None expected under normal conditions of use.

### SECTION 12: ECOLOGICAL INFORMATION

#### 12.1. Toxicity

<b>1,2-Propylene glycol (57-55-6)</b>	
LC50 Fish 1	51600 mg/l (Exposure time: 96 h - Species: Oncorhynchus mykiss [static])
EC50 Daphnia 1	10000 mg/l (Exposure time: 24 h - Species: Daphnia magna)
EC50 Other Aquatic Organisms 1	19000 mg/l (Exposure time: 96 h - Species: Pseudokirchneriella subcapitata)
LC 50 Fish 2	41 (41 - 47) mg/l (Exposure time: 96 h - Species: Oncorhynchus mykiss [static])
EC50 Daphnia 2	1000 mg/l (Exposure time: 48 h - Species: Daphnia magna [Static])

#### 12.2. Persistence and Degradability

<b>Cryo Freeze – Low Lying Fog Fluid</b>	
Persistence and Degradability	Not established.

#### 12.3. Bioaccumulative Potential

<b>Cryo Freeze – Low Lying Fog Fluid</b>	
Bioaccumulative Potential	Not established.

<b>1,2-Propylene glycol (57-55-6)</b>	
BCF fish 1	< 1

**12.4. Mobility in Soil** No additional information available

#### 12.5. Other Adverse Effects

**Other Information** : Avoid release to the environment.

### SECTION 13: DISPOSAL CONSIDERATIONS

#### 13.1. Waste treatment methods

**Waste Disposal Recommendations:** Dispose of waste material in accordance with all local, regional, national, and international regulations.

# Cryo Freeze – Low Lying Fog Fluid

## Safety Data Sheet

according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

### SECTION 14: TRANSPORT INFORMATION

In Accordance With ICAO/IATA/IMDG/DOT

**14.1. UN Number** Not regulated for transport

**14.2. UN Proper Shipping Name** Not regulated for transport

**14.3. Additional Information**

**Other information** : No supplementary information available.

**Transport by Sea** Not regulated for transport

**Air Transport** Not regulated for transport

### SECTION 15: REGULATORY INFORMATION

#### 15.1 US Federal Regulations

##### Water (7732-18-5)

Listed on the United States TSCA (Toxic Substances Control Act) inventory

##### 1,2-Propylene glycol (57-55-6)

Listed on the United States TSCA (Toxic Substances Control Act) inventory

##### EPA TSCA Regulatory Flag

Y2 - Y2 - indicates an exempt polymer that is a polyester and is made only from reactants included in a specified list of low concern reactants that comprises one of the eligibility criteria for the exemption rule.

#### 15.2 US State Regulations

##### 1,2-Propylene glycol (57-55-6)

U.S. - Minnesota - Hazardous Substance List

U.S. - New Jersey - Right to Know Hazardous Substance List

U.S. - Pennsylvania - RTK (Right to Know) List

U.S. - Texas - Effects Screening Levels - Long Term

U.S. - Texas - Effects Screening Levels - Short Term

### SECTION 16: OTHER INFORMATION

**Revision date** : 10/20/2014

**Other Information** : This document has been prepared in accordance with the SDS requirements of the OSHA Hazard Communication Standard 29 CFR 1910.1200.

*This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product*

SDS US (GHS HazCom) - US

# DaFiddy (for DF-50 Hazer)

Safety Data Sheet

According To Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules And Regulations  
Revision Date: 10/28/2014

Version: 1.0

## SECTION 1: IDENTIFICATION

### 1.1. Product Identifier

**Product Form:** Mixture

**Product Name:** DaFiddy

**1.2. Intended Use of the Product** Not available

**1.3. Name, Address, and Telephone of the Responsible Party**

#### Company

Froggy's Fog LLC

302 Rutherford lane

Columbia, TN 38401

T 615-469-4906 X26

[www.froggysfog.com](http://www.froggysfog.com)

**1.4. Emergency Telephone Number**

**Emergency Number** : 615-587-5400

## SECTION 2: HAZARDS IDENTIFICATION

**2.1. Classification of the Substance or Mixture**

**Classification (GHS-US)**

Not classified

**2.2. Label Elements**

**GHS-US Labeling** No labeling applicable

**2.3. Other Hazards**

Exposure may aggravate those with pre-existing eye, skin, or respiratory conditions.

**2.4. Unknown Acute Toxicity (GHS-US)** No data available

## SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

**3.1. Substance**

Not applicable

**3.2 Mixture**

Name	Product Identifier	% (w/w)	Classification (GHS-US)
White mineral oil, petroleum	(CAS No) 8042-47-5	Proprietary	Not classified

Full text of H-phrases: see section 16

## SECTION 4: FIRST AID MEASURES

**4.1. Description of First Aid Measures**

**General:** Never give anything by mouth to an unconscious person. If you feel unwell, seek medical advice (show the label where possible).

**Inhalation:** When symptoms occur: go into open air and ventilate suspected area. Obtain medical attention if breathing difficulty persists.

**Skin Contact:** Remove contaminated clothing. Drench affected area with water for at least 15 minutes. Obtain medical attention if irritation develops or persists.

**Eye Contact:** Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Obtain medical attention if pain, blinking or redness persist.

**Ingestion:** Rinse mouth. Do NOT induce vomiting. Seek medical attention.

**4.2. Most Important Symptoms and Effects Both Acute and Delayed**

**General:** Not expected to present a significant hazard under anticipated conditions of normal use.

**Inhalation:** None expected under normal conditions of use

**Skin Contact:** None expected under normal conditions of use

**Eye Contact:** None expected under normal conditions of use

**Ingestion:** Ingestion is likely to be harmful or have adverse effects.

# DaFiddy (for DF-50 Hazer)

## Safety Data Sheet

According To Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules And Regulations

### 4.3. Indication of Any Immediate Medical Attention and Special Treatment Needed

If you feel unwell, seek medical advice (show the label where possible).

## SECTION 5: FIRE-FIGHTING MEASURES

### 5.1. Extinguishing Media

**Suitable Extinguishing Media:** Dry chemical, foam, carbon dioxide.

**Unsuitable Extinguishing Media:** Do not use a heavy water stream. Use of heavy stream of water may spread fire.

### 5.2. Special Hazards Arising From the Substance or Mixture

**Fire Hazard:** Not considered flammable but may burn at high temperatures.

**Explosion Hazard:** Product is not explosive.

**Reactivity:** Hazardous reactions will not occur under normal conditions.

### 5.3. Advice for Firefighters

**Precautionary Measures Fire:** Exercise caution when fighting any chemical fire.

**Firefighting Instructions:** Use water spray or fog for cooling exposed containers.

**Protection During Firefighting:** Do not enter fire area without proper protective equipment, including respiratory protection.

**Hazardous Combustion Products:** Carbon oxides (CO, CO<sub>2</sub>). Toxic fumes may be released.

**Other Information:** Do not allow the product to be released into the environment. Do not allow run-off from fire fighting to enter drains or water courses.

### Reference to Other Sections

Refer to section 9 for flammability properties.

## SECTION 6: ACCIDENTAL RELEASE MEASURES

### 6.1. Personal Precautions, Protective Equipment and Emergency Procedures

**General Measures:** Avoid prolonged contact with eyes, skin and clothing. Avoid breathing (vapors, mist, spray).

#### 6.1.1. For Non-Emergency Personnel

**Protective Equipment:** Use appropriate personal protection equipment (PPE).

**Emergency Procedures:** Evacuate unnecessary personnel.

#### 6.1.2. For Emergency Personnel

**Protective Equipment:** Equip cleanup crew with proper protection.

**Emergency Procedures:** Ventilate area.

### 6.2. Environmental Precautions

Prevent entry to sewers and public waters.

### 6.3. Methods and Material for Containment and Cleaning Up

**For Containment:** Contain any spills with dikes or absorbents to prevent migration and entry into sewers or streams.

**Methods for Cleaning Up:** Clear up spills immediately and dispose of waste safely. Absorb and/or contain spill with inert material, then place in suitable container.

### 6.4. Reference to Other Sections

See heading 8, Exposure Controls and Personal Protection.

## SECTION 7: HANDLING AND STORAGE

### 7.1. Precautions for Safe Handling

**Additional Hazards When Processed:** When heated to decomposition may emit toxic fumes.

**Hygiene Measures:** Handle in accordance with good industrial hygiene and safety procedures. Wash hands and other exposed areas with mild soap and water before eating, drinking, or smoking and again when leaving work.

### 7.2. Conditions for Safe Storage, Including Any Incompatibilities

**Technical Measures:** Comply with applicable regulations.

**Storage Conditions:** Store in a dry, cool and well-ventilated place. Keep container closed when not in use. Keep/Store away from extremely high or low temperatures, direct sunlight, incompatible materials.

**Incompatible Materials:** Strong acids. Strong bases. Strong oxidizers.

### 7.3. Specific End Use(s) Not available

## SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

### 8.1. Control Parameters

No Occupational Exposure Limits (OELs) have been established for this product or its chemical components.

# DaFiddy (for DF-50 Hazer)

## Safety Data Sheet

According To Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules And Regulations

### 8.2. Exposure Controls

**Appropriate Engineering Controls:** Ensure adequate ventilation, especially in confined areas. Ensure all national/local regulations are observed.

**Personal Protective Equipment:** Not generally required. The use of personal protective equipment may be necessary as conditions warrant.

**Materials for Protective Clothing:** Chemically resistant materials and fabrics.

**Hand Protection:** Wear chemically resistant protective gloves.

**Eye Protection:** Chemical goggles or safety glasses.

**Respiratory Protection:** Use NIOSH-approved air-purifying or supplied-air respirator where airborne concentrations of vapor or mist are expected to exceed exposure limits.

**Other Information:** When using, do not eat, drink or smoke.

## SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

### 9.1. Information on Basic Physical and Chemical Properties

Physical State	: Liquid
Appearance	: Colorless, oily liquid
Odor	: Odorless
Odor Threshold	: Not available
pH	: Not available
Evaporation Rate	: Not available
Melting Point	: Not available
Freezing Point	: Not available
Boiling Point	: Not available
Flash Point	: 138 °C (280.40 °F) - Cleveland Open Cup
Auto-ignition Temperature	: Not available
Decomposition Temperature	: Not available
Flammability (solid, gas)	: Not available
Lower Flammable Limit	: Not available
Upper Flammable Limit	: Not available
Vapor Pressure	: < 1 mm Hg @20°C (68°F)
Relative Vapor Density at 20 °C	: > 1
Relative Density	: Not available
Specific Gravity	: 0.818 - 0.880 @25°C (77°F)
Solubility	: Negligible in water (below 0.1%); soluble in hydrocarbons
Partition Coefficient: N-octanol/water	: Not available
Viscosity	: Not available
Explosion Data – Sensitivity to Mechanical Impact	: Not expected to present an explosion hazard due to mechanical impact.
Explosion Data – Sensitivity to Static Discharge	: Not expected to present an explosion hazard due to static discharge.

## SECTION 10: STABILITY AND REACTIVITY

- 10.1. Reactivity:** Hazardous reactions will not occur under normal conditions.
- 10.2. Chemical Stability:** Stable under normal conditions.
- 10.3. Possibility of Hazardous Reactions:** Hazardous polymerization will not occur.
- 10.4. Conditions to Avoid:** Direct sunlight. Extremely high or low temperatures. Incompatible materials.
- 10.5. Incompatible Materials:** Strong acids. Strong bases. Strong oxidizers.
- 10.6. Hazardous Decomposition Products:** Carbon oxides (CO, CO<sub>2</sub>). Toxic vapors.

## SECTION 11: TOXICOLOGICAL INFORMATION

### 11.1. Information on Toxicological Effects - Product

**Acute Toxicity:** Not classified

**LD50 and LC50 Data:** Not available

**Skin Corrosion/Irritation:** Not classified

# DaFiddy (for DF-50 Hazer)

## Safety Data Sheet

According To Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules And Regulations

**Serious Eye Damage/Irritation:** Not classified

**Respiratory or Skin Sensitization:** Not classified

**Germ Cell Mutagenicity:** Not classified

**Teratogenicity:** Not available

**Carcinogenicity:** Not classified

**Specific Target Organ Toxicity (Repeated Exposure):** Not classified

**Reproductive Toxicity:** Not classified

**Specific Target Organ Toxicity (Single Exposure):** Not classified

**Aspiration Hazard:** Not classified

**Symptoms/Injuries After Inhalation:** Prolonged exposure to liquid may cause a mild irritation.

**Symptoms/Injuries After Skin Contact:** Contact during a long period may cause slight irritation.

**Symptoms/Injuries After Eye Contact:** May cause minor eye irritation.

**Symptoms/Injuries After Ingestion:** Ingestion is likely to be harmful or have adverse effects.

### 11.2. Information on Toxicological Effects - Ingredient(s)

LD50 and LC50 Data:

White mineral oil, petroleum (8042-47-5)	
LD50 Oral Rat	> 5000 mg/kg

## SECTION 12: ECOLOGICAL INFORMATION

**12.1. Toxicity** No additional information available

White mineral oil, petroleum (8042-47-5)	
LC50 Fish 1	> 10000 mg/l (Exposure time: 96 h - Species: Lepomis macrochirus)

### Persistence and Degradability

DaFiddy	
Persistence and Degradability	Not established.

### 12.3. Bioaccumulative Potential

DaFiddy	
Bioaccumulative Potential	Not established.

White mineral oil, petroleum (8042-47-5)	
Log Pow	> 6

**12.4. Mobility in Soil** Not available

### 12.5. Other Adverse Effects

**Other Information:** Avoid release to the environment.

## SECTION 13: DISPOSAL CONSIDERATIONS

### 13.1. Waste treatment methods

**Waste Disposal Recommendations:** Dispose of waste material in accordance with all local, regional, national, provincial, territorial and international regulations.

## SECTION 14: TRANSPORT INFORMATION

**14.1. In Accordance with DOT** Not regulated for transport

**14.2. In Accordance with IMDG** Not regulated for transport

**14.3. In Accordance with IATA** Not regulated for transport

**14.4. In Accordance with TDG** Not regulated for transport

## SECTION 15: REGULATORY INFORMATION

### 15.1. US Federal Regulations

White mineral oil, petroleum (8042-47-5)	
Listed on the United States TSCA (Toxic Substances Control Act) inventory	

### 15.2. US State Regulations

White mineral oil, petroleum (8042-47-5)	
U.S. - Texas - Effects Screening Levels - Long Term	



# DaFiddy (for DF-50 Hazer)

## Safety Data Sheet

According To Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules And Regulations

U.S. - Texas - Effects Screening Levels - Short Term

### 15.3. Canadian Regulations

#### DaFiddy

WHMIS Classification Uncontrolled product according to WHMIS classification criteria

#### White mineral oil, petroleum (8042-47-5)

Listed on the Canadian DSL (Domestic Substances List)

WHMIS Classification Uncontrolled product according to WHMIS classification criteria

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations (CPR) and the SDS contains all of the information required by CPR.

### SECTION 16: OTHER INFORMATION, INCLUDING DATE OF PREPARATION OR LAST REVISION

**Revision Date** : 10/28/2014

**Other Information** : This document has been prepared in accordance with the SDS requirements of the OSHA Hazard Communication Standard 29 CFR 1910.1200.

#### Party Responsible for the Preparation of This Document

Froggy's Fog LLC  
302 Rutherford lane  
Columbia, TN 38401  
T 615-469-4906 X26  
[www.froggysfog.com](http://www.froggysfog.com)

*This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product.*

North America GHS US 2012 & WHMIS



# Krazy Haze

## Safety Data Sheet

Froggy's Fog LLC  
302 Rutherford Lane  
Columbia, TN 38401  
United States  
Phone: (615) 469-4906

according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

Version: 1.0  
Revision Date: 10/20/2014

### SECTION 1: IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY

#### 1.1. Product Identifier

**Product Form:** Mixture

**Product Name:** Krazy Haze

#### 1.2. Intended Use of the Product

**Use of the Substance/Mixture:** Theatrical Fog/Haze

#### 1.3. Name, Address, and Telephone of the Responsible Party

**Froggy's Fog LLC**

302 Rutherford Lane

Columbia, TN 38401

1-615-469-4906

[www.froggysfog.com](http://www.froggysfog.com)

#### 1.4. Emergency Telephone Number

Chemtrec: (800) 424-9300

### SECTION 2: HAZARDS IDENTIFICATION

#### 2.1. Classification of the Substance or Mixture

**Classification (GHS-US)**

Not classified

#### 2.2. Label Elements

**GHS-US Labeling**

No labeling required

#### 2.3. Other Hazards

**Other Hazards Not Contributing to the Classification:** Exposure may aggravate those with pre-existing eye, skin, or respiratory conditions.

#### 2.4. Unknown Acute Toxicity (GHS-US)

No data available

### SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

#### 3.1. Substance

Not applicable

#### 3.2. Mixture

Name	Product Identifier	%	Classification (GHS-US)
Water	(CAS No) 7732-18-5	Proprietary	Not classified
Triethylene glycol	(CAS No) 112-27-6	Proprietary	Not classified
1,2-Propylene glycol	(CAS No) 57-55-6	Proprietary	Not classified

The specific chemical identity and/or exact percentage of composition has been withheld as a trade secret.

Full text of H-phrases: see section 16

### SECTION 4: FIRST AID MEASURES

#### 4.1. Description of First Aid Measures

**First-aid Measures General:** Never give anything by mouth to an unconscious person. If you feel unwell, seek medical advice (show the label where possible).

**First-aid Measures After Inhalation:** When symptoms occur: go into open air and ventilate suspected area. Obtain medical attention if breathing difficulty persists.

**First-aid Measures After Skin Contact:** Remove contaminated clothing. Drench affected area with water for at least 15 minutes. Obtain medical attention if irritation develops or persists.

**First-aid Measures After Eye Contact:** Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Obtain medical attention if pain, blinking or redness persist.

**First-aid Measures After Ingestion:** Rinse mouth. Do NOT induce vomiting. Seek medical attention.

# Krazy Haze

## Safety Data Sheet

according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

### 4.2. Most important symptoms and effects, both acute and delayed

**Symptoms/Injuries:** Not expected to present a significant hazard under anticipated conditions of normal use.

**Symptoms/Injuries After Inhalation:** None expected under normal conditions of use.

**Symptoms/Injuries After Skin Contact:** None expected under normal conditions of use.

**Symptoms/Injuries After Eye Contact:** None expected under normal conditions of use.

**Symptoms/Injuries After Ingestion:** None expected under normal conditions of use.

### 4.3. Indication of Any Immediate Medical Attention and Special Treatment Needed

If you feel unwell, seek medical advice (show the label where possible).

## SECTION 5: FIREFIGHTING MEASURES

### 5.1. Extinguishing Media

**Suitable Extinguishing Media:** Use extinguishing media appropriate for surrounding fire.

**Unsuitable Extinguishing Media:** Do not use a heavy water stream. Use of heavy stream of water may spread fire.

### 5.2. Special Hazards Arising From the Substance or Mixture

**Fire Hazard:** Not flammable.

**Explosion Hazard:** Product is not explosive.

**Reactivity:** Hazardous reactions will not occur under normal conditions.

### 5.3. Advice for Firefighters

**Precautionary Measures Fire:** Exercise caution when fighting any chemical fire.

**Firefighting Instructions:** Use water spray or fog for cooling exposed containers.

**Protection During Firefighting:** Do not enter fire area without proper protective equipment, including respiratory protection.

**Other information:** Do not allow the product to be released into the environment. Do not allow run-off from fire fighting to enter drains or water courses.

## SECTION 6: ACCIDENTAL RELEASE MEASURES

### 6.1. Personal Precautions, Protective Equipment and Emergency Procedures

**General Measures:** Avoid prolonged contact with eyes, skin and clothing. Avoid breathing (vapors, mist, spray).

#### 6.1.1. For Non-emergency Personnel

**Protective Equipment:** Use appropriate personal protection equipment (PPE).

**Emergency Procedures:** Evacuate unnecessary personnel.

#### 6.1.2. For Emergency Responders

**Protective Equipment:** Equip cleanup crew with proper protection.

**Emergency Procedures:** Ventilate area.

### 6.2. Environmental Precautions

Prevent entry to sewers and public waters.

### 6.3. Methods and Material for Containment and Cleaning Up

**For Containment:** Contain any spills with dikes or absorbents to prevent migration and entry into sewers or streams.

**Methods for Cleaning Up:** Clear up spills immediately and dispose of waste safely. Absorb and/or contain spill with inert material, then place in suitable container.

### 6.4. Reference to Other Sections

See heading 8, Exposure Controls and Personal Protection.

## SECTION 7: HANDLING AND STORAGE

### 7.1. Precautions for Safe Handling

**Hygiene Measures:** Handle in accordance with good industrial hygiene and safety procedures. Wash hands and other exposed areas with mild soap and water before eating, drinking, or smoking and again when leaving work.

### 7.2. Conditions for Safe Storage, Including Any Incompatibilities

**Technical Measures:** Comply with applicable regulations.

**Storage Conditions:** Store in a dry, cool and well-ventilated place. Keep container closed when not in use. Keep/Store away from extremely high or low temperatures, direct sunlight, incompatible materials.

**Incompatible Products:** Strong acids. Strong bases. Strong oxidizers.

### 7.3. Specific End Use(s)

Theatrical Fog/Haze.

# Krazy Haze

## Safety Data Sheet

according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

### SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

#### 8.1. Control Parameters

No Occupational Exposure Limits (OELs) have been established for this product or its chemical components.

#### 8.2. Exposure Controls

<b>Appropriate Engineering Controls</b>	: Ensure adequate ventilation, especially in confined areas. Ensure all national/local regulations are observed.
<b>Personal Protective Equipment</b>	: Not generally required. The use of personal protective equipment may be necessary as conditions warrant.
<b>Materials for Protective Clothing</b>	: Chemically resistant materials and fabrics.
<b>Hand Protection</b>	: Wear chemically resistant protective gloves.
<b>Eye Protection</b>	: Chemical goggles or safety glasses.
<b>Respiratory Protection</b>	: Use NIOSH-approved air-purifying or supplied-air respirator where airborne concentrations of vapor or mist are expected to exceed exposure limits.
<b>Other Information</b>	: When using, do not eat, drink or smoke.

### SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

#### 9.1. Information on Basic Physical and Chemical Properties

<b>Physical State</b>	: Liquid
<b>Appearance</b>	: Clear.
<b>Odor</b>	: Odorless.
<b>Odor Threshold</b>	: No data available
<b>pH</b>	: Unknown
<b>Relative Evaporation Rate (butylacetate=1)</b>	: No data available
<b>Melting Point</b>	: No data available
<b>Freezing Point</b>	: -8°C (17.6°F)
<b>Boiling Point</b>	: 105 °C (221°F)
<b>Flash Point</b>	: Does not flash
<b>Auto-ignition Temperature</b>	: No data available
<b>Decomposition Temperature</b>	: No data available
<b>Flammability (solid, gas)</b>	: No data available
<b>Vapor Pressure</b>	: No data available
<b>Relative Vapor Density at 20 °C</b>	: No data available
<b>Relative Density</b>	: No data available
<b>Specific Gravity</b>	: Not available
<b>Solubility</b>	: Soluble in water.
<b>Log Pow</b>	: No data available
<b>Log Kow</b>	: No data available
<b>Viscosity, Kinematic</b>	: No data available
<b>Viscosity, Dynamic</b>	: No data available
<b>Explosive Properties</b>	: No data available
<b>Oxidizing Properties</b>	: No data available
<b>Explosive Limits</b>	: Not applicable

#### 9.2. Other Information

No additional information available

### SECTION 10: STABILITY AND REACTIVITY

- 10.1 Reactivity:** Hazardous reactions will not occur under normal conditions.
- 10.2 Chemical Stability:** Stable under normal conditions.
- 10.3 Possibility of Hazardous Reactions:** Hazardous polymerization will not occur.
- 10.4 Conditions to Avoid:** Direct sunlight. Extremely high or low temperatures. Incompatible materials.
- 10.5 Incompatible Materials:** Strong acids. Strong bases. Strong oxidizers.
- 10.6 Hazardous Decomposition Products:** Carbon oxides (CO, CO<sub>2</sub>).

# Krazy Haze

## Safety Data Sheet

according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

### SECTION 11: TOXICOLOGICAL INFORMATION

#### 11.1. Information On Toxicological Effects

Acute Toxicity : Not classified

<b>Water (7732-18-5)</b>	
LC50 Inhalation Rat (ppm)	100000 ppm
<b>1,2-Propylene glycol (57-55-6)</b>	
LD50 Oral Rat	20000 mg/kg
LD50 Dermal Rabbit	20800 mg/kg
<b>Triethylene glycol (112-27-6)</b>	
LD50 Oral Rat	15000 mg/kg
LD50 Dermal Rabbit	> 20 ml/kg

**Skin Corrosion/Irritation:** Not classified

pH: unknown

**Serious Eye Damage/Irritation:** Not classified

pH: unknown

**Respiratory or Skin Sensitization:** Not classified

**Germ Cell Mutagenicity:** Not classified

**Carcinogenicity:** Not classified

**Reproductive Toxicity:** Not classified

**Specific Target Organ Toxicity (Single Exposure):** Not classified

**Specific Target Organ Toxicity (Repeated Exposure):** Not classified

**Aspiration Hazard:** Not classified

**Symptoms/Injuries After Inhalation:** None expected under normal conditions of use.

**Symptoms/Injuries After Skin Contact:** None expected under normal conditions of use.

**Symptoms/Injuries After Eye Contact:** None expected under normal conditions of use.

**Symptoms/Injuries After Ingestion:** None expected under normal conditions of use.

### SECTION 12: ECOLOGICAL INFORMATION

#### 12.1. Toxicity

<b>1,2-Propylene glycol (57-55-6)</b>	
LC50 Fish 1	51600 mg/l (Exposure time: 96 h - Species: Oncorhynchus mykiss [static])
EC50 Daphnia 1	10000 mg/l (Exposure time: 24 h - Species: Daphnia magna)
EC50 Other Aquatic Organisms 1	19000 mg/l (Exposure time: 96 h - Species: Pseudokirchneriella subcapitata)
LC 50 Fish 2	41 (41 - 47) mg/l (Exposure time: 96 h - Species: Oncorhynchus mykiss [static])
EC50 Daphnia 2	1000 mg/l (Exposure time: 48 h - Species: Daphnia magna [Static])

<b>Triethylene glycol (112-27-6)</b>	
LC50 Fish 1	56200 - 63700 mg/l (Exposure time: 96 h - Species: Pimephales promelas [flow-through])
EC50 Daphnia 1	42426 mg/l (Exposure time: 48 h - Species: Daphnia magna)
LC 50 Fish 2	10000 mg/l (Exposure time: 96 h - Species: Lepomis macrochirus [static])

#### 12.2. Persistence and Degradability

<b>Krazy Haze</b>	
Persistence and Degradability	Not established.

#### 12.3. Bioaccumulative Potential

<b>Krazy Haze</b>	
Bioaccumulative Potential	Not established.

<b>1,2-Propylene glycol (57-55-6)</b>	
BCF fish 1	< 1

<b>Triethylene glycol (112-27-6)</b>	
Log Pow	-1.98 (at 25 °C)

**12.4. Mobility in Soil** No additional information available

# Krazy Haze

## Safety Data Sheet

according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

### 12.5. Other Adverse Effects

**Other Information** : Avoid release to the environment.

## SECTION 13: DISPOSAL CONSIDERATIONS

### 13.1. Waste treatment methods

**Waste Disposal Recommendations:** Dispose of waste material in accordance with all local, regional, national, and international regulations.

## SECTION 14: TRANSPORT INFORMATION

In Accordance With ICAO/IATA/IMDG/DOT

**14.1. UN Number** Not regulated for transport

**14.2. UN Proper Shipping Name** Not regulated for transport

### 14.3. Additional Information

**Other information** : No supplementary information available.

**Transport by Sea** Not regulated for transport

**Air Transport** Not regulated for transport

## SECTION 15: REGULATORY INFORMATION

### 15.1 US Federal Regulations

#### Water (7732-18-5)

Listed on the United States TSCA (Toxic Substances Control Act) inventory

#### 1,2-Propylene glycol (57-55-6)

Listed on the United States TSCA (Toxic Substances Control Act) inventory

#### EPA TSCA Regulatory Flag

Y2 - Y2 - indicates an exempt polymer that is a polyester and is made only from reactants included in a specified list of low concern reactants that comprises one of the eligibility criteria for the exemption rule.

#### Triethylene glycol (112-27-6)

Listed on the United States TSCA (Toxic Substances Control Act) inventory

### 15.2 US State Regulations

#### 1,2-Propylene glycol (57-55-6)

U.S. - Minnesota - Hazardous Substance List  
U.S. - New Jersey - Right to Know Hazardous Substance List  
U.S. - Pennsylvania - RTK (Right to Know) List  
U.S. - Texas - Effects Screening Levels - Long Term  
U.S. - Texas - Effects Screening Levels - Short Term

#### Triethylene glycol (112-27-6)

U.S. - Pennsylvania - RTK (Right to Know) List  
U.S. - Texas - Effects Screening Levels - Long Term  
U.S. - Texas - Effects Screening Levels - Short Term

## SECTION 16: OTHER INFORMATION

**Revision date** : 10/20/2014

**Other Information** : This document has been prepared in accordance with the SDS requirements of the OSHA Hazard Communication Standard 29 CFR 1910.1200.

*This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product*

SDS US (GHS HazCom) - US



# Neutronic Haze

## Safety Data Sheet

Froggy's Fog LLC  
302 Rutherford Lane  
Columbia, TN 38401  
United States  
Phone: (615) 469-4906

according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

Version: 1.0  
Revision Date: 10/20/2014

### SECTION 1: IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY

#### 1.1. Product Identifier

**Product Form:** Mixture

**Product Name:** Neutronic Haze

#### 1.2. Intended Use of the Product

**Use of the Substance/Mixture:** Theatrical Fog/Haze

#### 1.3. Name, Address, and Telephone of the Responsible Party

**Froggy's Fog LLC**

302 Rutherford Lane

Columbia, TN 38401

1-615-469-4906

[www.froggysfog.com](http://www.froggysfog.com)

#### 1.4. Emergency Telephone Number

Chemtrec: (800) 424-9300

### SECTION 2: HAZARDS IDENTIFICATION

#### 2.1. Classification of the Substance or Mixture

**Classification (GHS-US)**

Not classified

#### 2.2. Label Elements

**GHS-US Labeling**

No labeling required

#### 2.3. Other Hazards

**Other Hazards Not Contributing to the Classification:** Exposure may aggravate those with pre-existing eye, skin, or respiratory conditions.

#### 2.4. Unknown Acute Toxicity (GHS-US)

No data available

### SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

#### 3.1. Substance

Not applicable

#### 3.2. Mixture

Name	Product Identifier	%	Classification (GHS-US)
Water	(CAS No) 7732-18-5	Proprietary	Not classified
Glycerin	(CAS No) 56-81-5	Proprietary	Not classified

The specific chemical identity and/or exact percentage of composition has been withheld as a trade secret.

Full text of H-phrases: see section 16

### SECTION 4: FIRST AID MEASURES

#### 4.1. Description of First Aid Measures

**First-aid Measures General:** Never give anything by mouth to an unconscious person. If you feel unwell, seek medical advice (show the label where possible).

**First-aid Measures After Inhalation:** When symptoms occur: go into open air and ventilate suspected area. Obtain medical attention if breathing difficulty persists.

**First-aid Measures After Skin Contact:** Remove contaminated clothing. Drench affected area with water for at least 15 minutes. Obtain medical attention if irritation develops or persists.

**First-aid Measures After Eye Contact:** Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Obtain medical attention if pain, blinking or redness persist.

**First-aid Measures After Ingestion:** Rinse mouth. Do NOT induce vomiting. Seek medical attention.

#### 4.2. Most important symptoms and effects, both acute and delayed

**Symptoms/Injuries:** Not expected to present a significant hazard under anticipated conditions of normal use.

# Neutronic Haze

## Safety Data Sheet

according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

**Symptoms/Injuries After Inhalation:** None expected under normal conditions of use.

**Symptoms/Injuries After Skin Contact:** None expected under normal conditions of use.

**Symptoms/Injuries After Eye Contact:** None expected under normal conditions of use.

**Symptoms/Injuries After Ingestion:** None expected under normal conditions of use.

### 4.3. Indication of Any Immediate Medical Attention and Special Treatment Needed

If you feel unwell, seek medical advice (show the label where possible).

## SECTION 5: FIREFIGHTING MEASURES

### 5.1. Extinguishing Media

**Suitable Extinguishing Media:** Use extinguishing media appropriate for surrounding fire.

**Unsuitable Extinguishing Media:** Do not use a heavy water stream. Use of heavy stream of water may spread fire.

### 5.2. Special Hazards Arising From the Substance or Mixture

**Fire Hazard:** Not flammable.

**Explosion Hazard:** Product is not explosive.

**Reactivity:** Hazardous reactions will not occur under normal conditions.

### 5.3. Advice for Firefighters

**Precautionary Measures Fire:** Exercise caution when fighting any chemical fire.

**Firefighting Instructions:** Use water spray or fog for cooling exposed containers.

**Protection During Firefighting:** Do not enter fire area without proper protective equipment, including respiratory protection.

**Other information:** Do not allow the product to be released into the environment. Do not allow run-off from fire fighting to enter drains or water courses.

## SECTION 6: ACCIDENTAL RELEASE MEASURES

### 6.1. Personal Precautions, Protective Equipment and Emergency Procedures

**General Measures:** Avoid prolonged contact with eyes, skin and clothing. Avoid breathing (vapors, mist, spray).

#### 6.1.1. For Non-emergency Personnel

**Protective Equipment:** Use appropriate personal protection equipment (PPE).

**Emergency Procedures:** Evacuate unnecessary personnel.

#### 6.1.2. For Emergency Responders

**Protective Equipment:** Equip cleanup crew with proper protection.

**Emergency Procedures:** Ventilate area.

### 6.2. Environmental Precautions

Prevent entry to sewers and public waters.

### 6.3. Methods and Material for Containment and Cleaning Up

**For Containment:** Contain any spills with dikes or absorbents to prevent migration and entry into sewers or streams.

**Methods for Cleaning Up:** Clear up spills immediately and dispose of waste safely. Absorb and/or contain spill with inert material, then place in suitable container.

### 6.4. Reference to Other Sections

See heading 8, Exposure Controls and Personal Protection.

## SECTION 7: HANDLING AND STORAGE

### 7.1. Precautions for Safe Handling

**Hygiene Measures:** Handle in accordance with good industrial hygiene and safety procedures. Wash hands and other exposed areas with mild soap and water before eating, drinking, or smoking and again when leaving work.

### 7.2. Conditions for Safe Storage, Including Any Incompatibilities

**Technical Measures:** Comply with applicable regulations.

**Storage Conditions:** Store in a dry, cool and well-ventilated place. Keep container closed when not in use. Keep/Store away from extremely high or low temperatures, direct sunlight, incompatible materials.

**Incompatible Products:** Strong acids. Strong bases. Strong oxidizers.

### 7.3. Specific End Use(s)

Theatrical Fog/Haze.

## SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

### 8.1. Control Parameters



# Neutronic Haze

## Safety Data Sheet

according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

<b>Glycerin (56-81-5)</b>		
<b>USA OSHA</b>	<b>OSHA PEL (TWA) (mg/m<sup>3</sup>)</b>	<b>5 mg/m<sup>3</sup></b>

### 8.2. Exposure Controls

<b>Appropriate Engineering Controls</b>	: Ensure adequate ventilation, especially in confined areas. Ensure all national/local regulations are observed.
<b>Personal Protective Equipment</b>	: Not generally required. The use of personal protective equipment may be necessary as conditions warrant.
<b>Materials for Protective Clothing</b>	: Chemically resistant materials and fabrics.
<b>Hand Protection</b>	: Wear chemically resistant protective gloves.
<b>Eye Protection</b>	: Chemical goggles or safety glasses.
<b>Respiratory Protection</b>	: Use NIOSH-approved air-purifying or supplied-air respirator where airborne concentrations of vapor or mist are expected to exceed exposure limits.
<b>Other Information</b>	: When using, do not eat, drink or smoke.

## SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

### 9.1. Information on Basic Physical and Chemical Properties

<b>Physical State</b>	: Liquid
<b>Appearance</b>	: Clear.
<b>Odor</b>	: Odorless.
<b>Odor Threshold</b>	: No data available
<b>pH</b>	: Unknown
<b>Relative Evaporation Rate (butylacetate=1)</b>	: No data available
<b>Melting Point</b>	: No data available
<b>Freezing Point</b>	: -8°C (17.6°F)
<b>Boiling Point</b>	: 114 °C (237.2°F)
<b>Flash Point</b>	: Does not flash
<b>Auto-ignition Temperature</b>	: No data available
<b>Decomposition Temperature</b>	: No data available
<b>Flammability (solid, gas)</b>	: No data available
<b>Vapor Pressure</b>	: No data available
<b>Relative Vapor Density at 20 °C</b>	: No data available
<b>Relative Density</b>	: No data available
<b>Specific Gravity</b>	: Not available
<b>Solubility</b>	: Soluble in water.
<b>Log Pow</b>	: No data available
<b>Log Kow</b>	: No data available
<b>Viscosity, Kinematic</b>	: No data available
<b>Viscosity, Dynamic</b>	: No data available
<b>Explosive Properties</b>	: No data available
<b>Oxidizing Properties</b>	: No data available
<b>Explosive Limits</b>	: Not applicable

**9.2. Other Information** No additional information available

## SECTION 10: STABILITY AND REACTIVITY

- 10.1 Reactivity:** Hazardous reactions will not occur under normal conditions.
- 10.2 Chemical Stability:** Stable under normal conditions.
- 10.3 Possibility of Hazardous Reactions:** Hazardous polymerization will not occur.
- 10.4 Conditions to Avoid:** Direct sunlight. Extremely high or low temperatures. Incompatible materials.
- 10.5 Incompatible Materials:** Strong acids. Strong bases. Strong oxidizers.
- 10.6 Hazardous Decomposition Products:** Carbon oxides (CO, CO<sub>2</sub>).

# Neutronic Haze

## Safety Data Sheet

according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

### SECTION 11: TOXICOLOGICAL INFORMATION

#### 11.1. Information On Toxicological Effects

**Acute Toxicity** : Not classified

<b>Water (7732-18-5)</b>	
<b>LC50 Inhalation Rat (ppm)</b>	100000 ppm
<b>Glycerin (56-81-5)</b>	
<b>LD50 Dermal Rabbit</b>	> 10 g/kg
<b>LC50 Inhalation Rat (mg/l)</b>	> 570 mg/m <sup>3</sup> (Exposure time: 1 h)

**Skin Corrosion/Irritation:** Not classified

pH: unknown

**Serious Eye Damage/Irritation:** Not classified

pH: unknown

**Respiratory or Skin Sensitization:** Not classified

**Germ Cell Mutagenicity:** Not classified

**Carcinogenicity:** Not classified

**Reproductive Toxicity:** Not classified

**Specific Target Organ Toxicity (Single Exposure):** Not classified

**Specific Target Organ Toxicity (Repeated Exposure):** Not classified

**Aspiration Hazard:** Not classified

**Symptoms/Injuries After Inhalation:** None expected under normal conditions of use.

**Symptoms/Injuries After Skin Contact:** None expected under normal conditions of use.

**Symptoms/Injuries After Eye Contact:** None expected under normal conditions of use.

**Symptoms/Injuries After Ingestion:** None expected under normal conditions of use.

### SECTION 12: ECOLOGICAL INFORMATION

#### 12.1. Toxicity

<b>Glycerin (56-81-5)</b>	
<b>LC50 Fish 1</b>	51 (51 - 57) ml/l (Exposure time: 96 h - Species: <i>Oncorhynchus mykiss</i> [static])

#### 12.2. Persistence and Degradability

<b>Neutronic Haze</b>	
<b>Persistence and Degradability</b>	Not established.

#### 12.3. Bioaccumulative Potential

<b>Neutronic Haze</b>	
<b>Bioaccumulative Potential</b>	Not established.

<b>Glycerin (56-81-5)</b>	
<b>BCF fish 1</b>	(no bioaccumulation)
<b>Log Pow</b>	-1.76

**12.4. Mobility in Soil** No additional information available

#### 12.5. Other Adverse Effects

**Other Information** : Avoid release to the environment.

### SECTION 13: DISPOSAL CONSIDERATIONS

#### 13.1. Waste treatment methods

**Waste Disposal Recommendations:** Dispose of waste material in accordance with all local, regional, national, and international regulations.

# Neutronic Haze

Safety Data Sheet

according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

## SECTION 14: TRANSPORT INFORMATION

In Accordance With ICAO/IATA/IMDG/DOT

**14.1. UN Number** Not regulated for transport

**14.2. UN Proper Shipping Name** Not regulated for transport

**14.3. Additional Information**

**Other information** : No supplementary information available.

**Transport by Sea** Not regulated for transport

**Air Transport** Not regulated for transport

## SECTION 15: REGULATORY INFORMATION

**15.1 US Federal Regulations**

<b>Water (7732-18-5)</b>	
Listed on the United States TSCA (Toxic Substances Control Act) inventory	
<b>Glycerin (56-81-5)</b>	
Listed on the United States TSCA (Toxic Substances Control Act) inventory	
<b>EPA TSCA Regulatory Flag</b>	Y2 - Y2 - indicates an exempt polymer that is a polyester and is made only from reactants included in a specified list of low concern reactants that comprises one of the eligibility criteria for the exemption rule.

**15.2 US State Regulations**

<b>Glycerin (56-81-5)</b>
U.S. - Connecticut - Hazardous Air Pollutants - HLVs (30 min) U.S. - Connecticut - Hazardous Air Pollutants - HLVs (8 hr) U.S. - Idaho - Occupational Exposure Limits - TWAs U.S. - Massachusetts - Right To Know List U.S. - Michigan - Occupational Exposure Limits - TWAs U.S. - Minnesota - Hazardous Substance List U.S. - Minnesota - Permissible Exposure Limits - TWAs U.S. - New Hampshire - Regulated Toxic Air Pollutants - Ambient Air Levels (AALs) - 24-Hour U.S. - New Hampshire - Regulated Toxic Air Pollutants - Ambient Air Levels (AALs) - Annual U.S. - New Jersey - Right to Know Hazardous Substance List U.S. - North Dakota - Air Pollutants - Guideline Concentrations - 8-Hour U.S. - Oregon - Permissible Exposure Limits - TWAs U.S. - Pennsylvania - RTK (Right to Know) List U.S. - Tennessee - Occupational Exposure Limits - TWAs U.S. - Texas - Effects Screening Levels - Long Term U.S. - Texas - Effects Screening Levels - Short Term U.S. - Vermont - Permissible Exposure Limits - TWAs U.S. - Washington - Permissible Exposure Limits - STELs U.S. - Washington - Permissible Exposure Limits - TWAs

## SECTION 16: OTHER INFORMATION

**Revision date** : 10/20/2014

**Other Information** : This document has been prepared in accordance with the SDS requirements of the OSHA Hazard Communication Standard 29 CFR 1910.1200.

*This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product*

SDS US (GHS HazCom) - US



# Phaze Haze

## Safety Data Sheet

according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 /  
Rules and Regulations

Froggy's Fog LLC  
302 Rutherford Lane  
Columbia, TN 38401  
United States  
Phone: (615) 469-4906  
Version: 1.0  
Revision Date: 10/20/2014

### SECTION 1: IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY

#### 1.1. Product Identifier

**Product Name:** Phaze Haze

#### 1.2. Intended Use of the Product

**Use of the Substance/Mixture:** Theatrical Fog/Haze

#### 1.3. Name, Address, and Telephone of the Responsible Party

**Froggy's Fog LLC**  
302 Rutherford Lane  
Columbia, TN 38401  
1-615-469-4906

[www.froggysfog.com](http://www.froggysfog.com)

#### 1.4. Emergency Telephone Number

Chemtrec: (800) 424-9300

### SECTION 2: HAZARDS IDENTIFICATION

#### 2.1. Classification of the Substance or Mixture

##### Classification (GHS-US)

Not classified

#### 2.2. Label Elements

##### GHS-US Labeling

No labeling required

#### 2.3. Other Hazards

**Other Hazards Not Contributing to the Classification:** Exposure may aggravate those with pre-existing eye, skin, or respiratory conditions.

#### 2.4. Unknown Acute Toxicity (GHS-US)

No data available

### SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

#### 3.1. Substance

Not applicable

#### 3.2. Mixture

Name	Product Identifier	%	Classification (GHS-US)
Water	(CAS No) 7732-18-5	Proprietary	Not classified
Triethylene glycol	(CAS No) 112-27-6	Proprietary	Not classified
1,2-Propylene glycol	(CAS No) 57-55-6	Proprietary	Not classified

The specific chemical identity and/or exact percentage of composition has been withheld as a trade secret.

Full text of H-phrases: see section 16

### SECTION 4: FIRST AID MEASURES

#### 4.1. Description of First Aid Measures

**First-aid Measures General:** Never give anything by mouth to an unconscious person. If you feel unwell, seek medical advice (show the label where possible).

**First-aid Measures After Inhalation:** When symptoms occur: go into open air and ventilate suspected area. Obtain medical attention if breathing difficulty persists.

**First-aid Measures After Skin Contact:** Remove contaminated clothing. Drench affected area with water for at least 15 minutes. Obtain medical attention if irritation develops or persists.

**First-aid Measures After Eye Contact:** Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Obtain medical attention if pain, blinking or redness persist.

**First-aid Measures After Ingestion:** Rinse mouth. Do NOT induce vomiting. Seek medical attention.

#### 4.2. Most important symptoms and effects, both acute and delayed

**Symptoms/Injuries:** Not expected to present a significant hazard under anticipated conditions of normal use.

**Symptoms/Injuries After Inhalation:** None expected under normal conditions of use.

# Phaze Haze

## Safety Data Sheet

according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

**Symptoms/Injuries After Skin Contact:** None expected under normal conditions of use.

**Symptoms/Injuries After Eye Contact:** None expected under normal conditions of use.

**Symptoms/Injuries After Ingestion:** None expected under normal conditions of use.

### 4.3. Indication of Any Immediate Medical Attention and Special Treatment Needed

If you feel unwell, seek medical advice (show the label where possible).

## SECTION 5: FIREFIGHTING MEASURES

### 5.1. Extinguishing Media

**Suitable Extinguishing Media:** Use extinguishing media appropriate for surrounding fire.

**Unsuitable Extinguishing Media:** Do not use a heavy water stream. Use of heavy stream of water may spread fire.

### 5.2. Special Hazards Arising From the Substance or Mixture

**Fire Hazard:** Not flammable.

**Explosion Hazard:** Product is not explosive.

**Reactivity:** Hazardous reactions will not occur under normal conditions.

### 5.3. Advice for Firefighters

**Precautionary Measures Fire:** Exercise caution when fighting any chemical fire.

**Firefighting Instructions:** Use water spray or fog for cooling exposed containers.

**Protection During Firefighting:** Do not enter fire area without proper protective equipment, including respiratory protection.

**Other information:** Do not allow run-off from fire fighting to enter drains or water courses.

## SECTION 6: ACCIDENTAL RELEASE MEASURES

### 6.1. Personal Precautions, Protective Equipment and Emergency Procedures

**General Measures:** Avoid prolonged contact with eyes, skin and clothing. Avoid breathing (vapors, mist, spray).

#### 6.1.1. For Non-emergency Personnel

**Protective Equipment:** Use appropriate personal protection equipment (PPE).

**Emergency Procedures:** Evacuate unnecessary personnel.

#### 6.1.2. For Emergency Responders

**Protective Equipment:** Equip cleanup crew with proper protection.

**Emergency Procedures:** Ventilate area.

### 6.2. Environmental Precautions

Prevent entry to sewers and public waters.

### 6.3. Methods and Material for Containment and Cleaning Up

**For Containment:** Contain any spills with dikes or absorbents to prevent migration and entry into sewers or streams.

**Methods for Cleaning Up:** Clear up spills immediately and dispose of waste safely. Absorb and/or contain spill with inert material, then place in suitable container.

### 6.4. Reference to Other Sections

See heading 8, Exposure Controls and Personal Protection.

## SECTION 7: HANDLING AND STORAGE

### 7.1. Precautions for Safe Handling

**Hygiene Measures:** Handle in accordance with good industrial hygiene and safety procedures. Wash hands and other exposed areas with mild soap and water before eating, drinking, or smoking and again when leaving work.

### 7.2. Conditions for Safe Storage, Including Any Incompatibilities

**Technical Measures:** Comply with applicable regulations.

**Storage Conditions:** Store in a dry, cool and well-ventilated place. Keep container closed when not in use. Keep/Store away from extremely high or low temperatures, direct sunlight, incompatible materials.

**Incompatible Products:** Strong acids. Strong bases. Strong oxidizers.

### 7.3. Specific End Use(s)

Theatrical Fog/Haze.

## SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

### 8.1. Control Parameters

No Occupational Exposure Limits (OELs) have been established for this product or its chemical components.

### 8.2. Exposure Controls

**Appropriate Engineering Controls** : Ensure adequate ventilation, especially in confined areas. Ensure all national/local regulations are observed.

# Phaze Haze

## Safety Data Sheet

according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

<b>Personal Protective Equipment</b>	: Not generally required. The use of personal protective equipment may be necessary as conditions warrant.
<b>Materials for Protective Clothing</b>	: Chemically resistant materials and fabrics.
<b>Hand Protection</b>	: Wear chemically resistant protective gloves.
<b>Eye Protection</b>	: Chemical goggles or safety glasses.
<b>Respiratory Protection</b>	: Use NIOSH-approved air-purifying or supplied-air respirator where airborne concentrations of vapor or mist are expected to exceed exposure limits.
<b>Other Information</b>	: When using, do not eat, drink or smoke.

## SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

### 9.1. Information on Basic Physical and Chemical Properties

<b>Physical State</b>	: Liquid
<b>Appearance</b>	: Clear.
<b>Odor</b>	: Odorless.
<b>Odor Threshold</b>	: No data available
<b>pH</b>	: Unknown
<b>Relative Evaporation Rate (butylacetate=1)</b>	: No data available
<b>Melting Point</b>	: No data available
<b>Freezing Point</b>	: -33°C (-27.4°F)
<b>Boiling Point</b>	: 101 °C (213.8°F)
<b>Flash Point</b>	: Does not flash
<b>Auto-ignition Temperature</b>	: No data available
<b>Decomposition Temperature</b>	: No data available
<b>Flammability (solid, gas)</b>	: No data available
<b>Vapor Pressure</b>	: No data available
<b>Relative Vapor Density at 20 °C</b>	: No data available
<b>Relative Density</b>	: No data available
<b>Specific Gravity</b>	: Not available
<b>Solubility</b>	: Soluble in water.
<b>Log Pow</b>	: No data available
<b>Log Kow</b>	: No data available
<b>Viscosity, Kinematic</b>	: No data available
<b>Viscosity, Dynamic</b>	: No data available
<b>Explosive Properties</b>	: No data available
<b>Oxidizing Properties</b>	: No data available
<b>Explosive Limits</b>	: Not applicable

9.2. **Other Information** No additional information available

## SECTION 10: STABILITY AND REACTIVITY

- 10.1 **Reactivity:** Hazardous reactions will not occur under normal conditions.
- 10.2 **Chemical Stability:** Stable under normal conditions.
- 10.3 **Possibility of Hazardous Reactions:** Hazardous polymerization will not occur.
- 10.4 **Conditions to Avoid:** Direct sunlight. Extremely high or low temperatures. Incompatible materials.
- 10.5 **Incompatible Materials:** Strong acids. Strong bases. Strong oxidizers.
- 10.6 **Hazardous Decomposition Products:** Carbon oxides (CO, CO<sub>2</sub>).

## SECTION 11: TOXICOLOGICAL INFORMATION

### 11.1. Information On Toxicological Effects

**Acute Toxicity** : Not classified

<b>Water (7732-18-5)</b>	
<b>LC50 Inhalation Rat (ppm)</b>	100000 ppm

# Phaze Haze

## Safety Data Sheet

according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

<b>1,2-Propylene glycol (57-55-6)</b>	
LD50 Oral Rat	20000 mg/kg
LD50 Dermal Rabbit	20800 mg/kg
<b>Triethylene glycol (112-27-6)</b>	
LD50 Oral Rat	15000 mg/kg
LD50 Dermal Rabbit	> 20 ml/kg

**Skin Corrosion/Irritation:** Not classified

pH: unknown

**Serious Eye Damage/Irritation:** Not classified

pH: unknown

**Respiratory or Skin Sensitization:** Not classified

**Germ Cell Mutagenicity:** Not classified

**Carcinogenicity:** Not classified

**Reproductive Toxicity:** Not classified

**Specific Target Organ Toxicity (Single Exposure):** Not classified

**Specific Target Organ Toxicity (Repeated Exposure):** Not classified

**Aspiration Hazard:** Not classified

**Symptoms/Injuries After Inhalation:** None expected under normal conditions of use.

**Symptoms/Injuries After Skin Contact:** None expected under normal conditions of use.

**Symptoms/Injuries After Eye Contact:** None expected under normal conditions of use.

**Symptoms/Injuries After Ingestion:** None expected under normal conditions of use.

## SECTION 12: ECOLOGICAL INFORMATION

### 12.1. Toxicity

<b>1,2-Propylene glycol (57-55-6)</b>	
LC50 Fish 1	51600 mg/l (Exposure time: 96 h - Species: Oncorhynchus mykiss [static])
EC50 Daphnia 1	10000 mg/l (Exposure time: 24 h - Species: Daphnia magna)
EC50 Other Aquatic Organisms 1	19000 mg/l (Exposure time: 96 h - Species: Pseudokirchneriella subcapitata)
LC 50 Fish 2	41 (41 - 47) mg/l (Exposure time: 96 h - Species: Oncorhynchus mykiss [static])
EC50 Daphnia 2	1000 mg/l (Exposure time: 48 h - Species: Daphnia magna [Static])
<b>Triethylene glycol (112-27-6)</b>	
LC50 Fish 1	56200 - 63700 mg/l (Exposure time: 96 h - Species: Pimephales promelas [flow-through])
EC50 Daphnia 1	42426 mg/l (Exposure time: 48 h - Species: Daphnia magna)
LC 50 Fish 2	10000 mg/l (Exposure time: 96 h - Species: Lepomis macrochirus [static])

### 12.2. Persistence and Degradability

<b>Phaze Haze</b>	
Persistence and Degradability	Not established.

### 12.3. Bioaccumulative Potential

<b>Phaze Haze</b>	
Bioaccumulative Potential	Not established.

<b>1,2-Propylene glycol (57-55-6)</b>	
BCF fish 1	< 1

<b>Triethylene glycol (112-27-6)</b>	
Log Pow	-1.98 (at 25 °C)

**12.4. Mobility in Soil** No additional information available

### 12.5. Other Adverse Effects

**Other Information** : Avoid release to the environment.

## SECTION 13: DISPOSAL CONSIDERATIONS

### 13.1. Waste treatment methods

**Waste Disposal Recommendations:** Dispose of waste material in accordance with all local, regional, national, and international regulations.

# Phaze Haze

## Safety Data Sheet

according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

### SECTION 14: TRANSPORT INFORMATION

In Accordance With ICAO/IATA/IMDG/DOT

**14.1. UN Number** Not regulated for transport

**14.2. UN Proper Shipping Name** Not regulated for transport

**14.3. Additional Information**

**Other information** : No supplementary information available.

**Transport by Sea** Not regulated for transport

**Air Transport** Not regulated for transport

### SECTION 15: REGULATORY INFORMATION

#### 15.1 US Federal Regulations

##### Water (7732-18-5)

Listed on the United States TSCA (Toxic Substances Control Act) inventory

##### 1,2-Propylene glycol (57-55-6)

Listed on the United States TSCA (Toxic Substances Control Act) inventory

##### EPA TSCA Regulatory Flag

Y2 - Y2 - indicates an exempt polymer that is a polyester and is made only from reactants included in a specified list of low concern reactants that comprises one of the eligibility criteria for the exemption rule.

##### Triethylene glycol (112-27-6)

Listed on the United States TSCA (Toxic Substances Control Act) inventory

#### 15.2 US State Regulations

##### 1,2-Propylene glycol (57-55-6)

U.S. - Minnesota - Hazardous Substance List  
U.S. - New Jersey - Right to Know Hazardous Substance List  
U.S. - Pennsylvania - RTK (Right to Know) List  
U.S. - Texas - Effects Screening Levels - Long Term  
U.S. - Texas - Effects Screening Levels - Short Term

##### Triethylene glycol (112-27-6)

U.S. - Pennsylvania - RTK (Right to Know) List  
U.S. - Texas - Effects Screening Levels - Long Term  
U.S. - Texas - Effects Screening Levels - Short Term

### SECTION 16: OTHER INFORMATION

**Revision date** : 10/20/2014

**Other Information** : This document has been prepared in accordance with the SDS requirements of the OSHA Hazard Communication Standard 29 CFR 1910.1200.

*This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product*

SDS US (GHS HazCom) - US





# Quick Blast

## Extra Fast Dissipating Fog

### Safety Data Sheet

Froggy's Fog LLC  
302 Rutherford Lane  
Columbia, TN 38401  
United States  
Phone: (615) 469-4906

according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

Version: 1.0  
Revision Date: 10/20/2014

#### SECTION 1: IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY

##### 1.1. Product Identifier

**Product Form:** Mixture

**Product Name:** Quick Blast – Extra Fast Dissipating Fog

##### 1.2. Intended Use of the Product

**Use of the Substance/Mixture:** Theatrical Fog/Haze

##### 1.3. Name, Address, and Telephone of the Responsible Party

Froggy's Fog LLC  
302 Rutherford Lane  
Columbia, TN 38401  
1-615-469-4906

[www.froggysfog.com](http://www.froggysfog.com)

##### 1.4. Emergency Telephone Number

Chemtrec: (800) 424-9300

#### SECTION 2: HAZARDS IDENTIFICATION

##### 2.1. Classification of the Substance or Mixture

**Classification (GHS-US)**

Not classified

##### 2.2. Label Elements

**GHS-US Labeling**

No labeling required

##### 2.3. Other Hazards

**Other Hazards Not Contributing to the Classification:** Exposure may aggravate those with pre-existing eye, skin, or respiratory conditions.

##### 2.4. Unknown Acute Toxicity (GHS-US)

No data available

#### SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

##### 3.1. Substance

Not applicable

##### 3.2. Mixture

Name	Product Identifier	%	Classification (GHS-US)
Water	(CAS No) 7732-18-5	Proprietary	Not classified
1,2-Propylene glycol	(CAS No) 57-55-6	Proprietary	Not classified

The specific chemical identity and/or exact percentage of composition has been withheld as a trade secret.

Full text of H-phrases: see section 16

#### SECTION 4: FIRST AID MEASURES

##### 4.1. Description of First Aid Measures

**First-aid Measures General:** Never give anything by mouth to an unconscious person. If you feel unwell, seek medical advice (show the label where possible).

**First-aid Measures After Inhalation:** If symptoms occur: go into open air and ventilate suspected area. Obtain medical attention if breathing difficulty persists.

**First-aid Measures After Skin Contact:** Remove contaminated clothing. Drench affected area with water for at least 15 minutes. Obtain medical attention if irritation develops or persists.

**First-aid Measures After Eye Contact:** Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Obtain medical attention if pain, blinking or redness persist.

**First-aid Measures After Ingestion:** Rinse mouth. Do NOT induce vomiting. Seek medical attention.

# Quick Blast – Extra Fast Dissipating Fog

## Safety Data Sheet

according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

### 4.2. Most important symptoms and effects, both acute and delayed

**Symptoms/Injuries:** Not expected to present a significant hazard under anticipated conditions of normal use.

**Symptoms/Injuries After Inhalation:** None expected under normal conditions of use.

**Symptoms/Injuries After Skin Contact:** None expected under normal conditions of use.

**Symptoms/Injuries After Eye Contact:** None expected under normal conditions of use.

**Symptoms/Injuries After Ingestion:** None expected under normal conditions of use.

### 4.3. Indication of Any Immediate Medical Attention and Special Treatment Needed

If you feel unwell, seek medical advice (show the label where possible).

## SECTION 5: FIREFIGHTING MEASURES

### 5.1. Extinguishing Media

**Suitable Extinguishing Media:** Use extinguishing media appropriate for surrounding fire.

**Unsuitable Extinguishing Media:** Do not use a heavy water stream. Use of heavy stream of water may spread fire.

### 5.2. Special Hazards Arising From the Substance or Mixture

**Fire Hazard:** Not flammable.

**Explosion Hazard:** Product is not explosive.

**Reactivity:** Hazardous reactions will not occur under normal conditions.

### 5.3. Advice for Firefighters

**Precautionary Measures Fire:** Exercise caution when fighting any chemical fire.

**Firefighting Instructions:** Use water spray or fog for cooling exposed containers.

**Protection During Firefighting:** Do not enter fire area without proper protective equipment, including respiratory protection.

**Other information:** Do not allow the product to be released into the environment. Do not allow run-off from fire fighting to enter drains or water courses.

## SECTION 6: ACCIDENTAL RELEASE MEASURES

### 6.1. Personal Precautions, Protective Equipment and Emergency Procedures

**General Measures:** Avoid prolonged contact with eyes, skin and clothing. Avoid breathing (vapors, mist, spray).

#### 6.1.1. For Non-emergency Personnel

**Protective Equipment:** Use appropriate personal protection equipment (PPE).

**Emergency Procedures:** Evacuate unnecessary personnel.

#### 6.1.2. For Emergency Responders

**Protective Equipment:** Equip cleanup crew with proper protection.

**Emergency Procedures:** Ventilate area.

### 6.2. Environmental Precautions

Prevent entry to sewers and public waters.

### 6.3. Methods and Material for Containment and Cleaning Up

**For Containment:** Contain any spills with dikes or absorbents to prevent migration and entry into sewers or streams.

**Methods for Cleaning Up:** Clear up spills immediately and dispose of waste safely. Absorb and/or contain spill with inert material, then place in suitable container.

### 6.4. Reference to Other Sections

See heading 8, Exposure Controls and Personal Protection.

## SECTION 7: HANDLING AND STORAGE

### 7.1. Precautions for Safe Handling

**Hygiene Measures:** Handle in accordance with good industrial hygiene and safety procedures. Wash hands and other exposed areas with mild soap and water before eating, drinking, or smoking and again when leaving work.

### 7.2. Conditions for Safe Storage, Including Any Incompatibilities

**Technical Measures:** Comply with applicable regulations.

**Storage Conditions:** Store in a dry, cool and well-ventilated place. Keep container closed when not in use. Keep/Store away from extremely high or low temperatures, direct sunlight, incompatible materials.

**Incompatible Products:** Strong acids. Strong bases. Strong oxidizers.

### 7.3. Specific End Use(s)

Theatrical Fog/Haze.

# Quick Blast – Extra Fast Dissipating Fog

Safety Data Sheet

according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

## SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

### 8.1. Control Parameters

No Occupational Exposure Limits (OELs) have been established for this product or its chemical components.

### 8.2. Exposure Controls

<b>Appropriate Engineering Controls</b>	: Ensure adequate ventilation, especially in confined areas. Ensure all national/local regulations are observed.
<b>Personal Protective Equipment</b>	: Not generally required. The use of personal protective equipment may be necessary as conditions warrant.
<b>Materials for Protective Clothing</b>	: Chemically resistant materials and fabrics.
<b>Hand Protection</b>	: Wear chemically resistant protective gloves.
<b>Eye Protection</b>	: Chemical goggles or safety glasses.
<b>Respiratory Protection</b>	: Use NIOSH-approved air-purifying or supplied-air respirator where airborne concentrations of vapor or mist are expected to exceed exposure limits.
<b>Other Information</b>	: When using, do not eat, drink or smoke.

## SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

### 9.1. Information on Basic Physical and Chemical Properties

<b>Physical State</b>	: Liquid
<b>Appearance</b>	: Clear.
<b>Odor</b>	: Odorless.
<b>Odor Threshold</b>	: No data available
<b>pH</b>	: Unknown
<b>Relative Evaporation Rate (butylacetate=1)</b>	: No data available
<b>Melting Point</b>	: No data available
<b>Freezing Point</b>	: No data available
<b>Boiling Point</b>	: 100 °C (212°F)
<b>Flash Point</b>	: Does not flash
<b>Auto-ignition Temperature</b>	: No data available
<b>Decomposition Temperature</b>	: No data available
<b>Flammability (solid, gas)</b>	: No data available
<b>Vapor Pressure</b>	: No data available
<b>Relative Vapor Density at 20 °C</b>	: No data available
<b>Relative Density</b>	: No data available
<b>Specific Gravity</b>	: Not available
<b>Solubility</b>	: Soluble in water.
<b>Log Pow</b>	: No data available
<b>Log Kow</b>	: No data available
<b>Viscosity, Kinematic</b>	: No data available
<b>Viscosity, Dynamic</b>	: No data available
<b>Explosive Properties</b>	: No data available
<b>Oxidizing Properties</b>	: No data available
<b>Explosive Limits</b>	: Not applicable

### 9.2. Other Information

No additional information available

## SECTION 10: STABILITY AND REACTIVITY

- 10.1 Reactivity:** Hazardous reactions will not occur under normal conditions.
- 10.2 Chemical Stability:** Stable under normal conditions.
- 10.3 Possibility of Hazardous Reactions:** Hazardous polymerization will not occur.
- 10.4 Conditions to Avoid:** Direct sunlight. Extremely high or low temperatures. Incompatible materials.
- 10.5 Incompatible Materials:** Strong acids. Strong bases. Strong oxidizers.
- 10.6 Hazardous Decomposition Products:** Carbon oxides (CO, CO<sub>2</sub>).

# Quick Blast – Extra Fast Dissipating Fog

## Safety Data Sheet

according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

### SECTION 11: TOXICOLOGICAL INFORMATION

#### 11.1. Information On Toxicological Effects

Acute Toxicity : Not classified

Water (7732-18-5)	
LC50 Inhalation Rat (ppm)	100000 ppm
1,2-Propylene glycol (57-55-6)	
LD50 Oral Rat	20000 mg/kg
LD50 Dermal Rabbit	20800 mg/kg

Skin Corrosion/Irritation: Not classified

pH: unknown

Serious Eye Damage/Irritation: Not classified

pH: unknown

Respiratory or Skin Sensitization: Not classified

Germ Cell Mutagenicity: Not classified

Carcinogenicity: Not classified

Reproductive Toxicity: Not classified

Specific Target Organ Toxicity (Single Exposure): Not classified

Specific Target Organ Toxicity (Repeated Exposure): Not classified

Aspiration Hazard: Not classified

Symptoms/Injuries After Inhalation: None expected under normal conditions of use.

Symptoms/Injuries After Skin Contact: None expected under normal conditions of use.

Symptoms/Injuries After Eye Contact: None expected under normal conditions of use.

Symptoms/Injuries After Ingestion: None expected under normal conditions of use.

### SECTION 12: ECOLOGICAL INFORMATION

#### 12.1. Toxicity

1,2-Propylene glycol (57-55-6)	
LC50 Fish 1	51600 mg/l (Exposure time: 96 h - Species: Oncorhynchus mykiss [static])
EC50 Daphnia 1	10000 mg/l (Exposure time: 24 h - Species: Daphnia magna)
EC50 Other Aquatic Organisms 1	19000 mg/l (Exposure time: 96 h - Species: Pseudokirchneriella subcapitata)
LC 50 Fish 2	41 (41 - 47) mg/l (Exposure time: 96 h - Species: Oncorhynchus mykiss [static])
EC50 Daphnia 2	1000 mg/l (Exposure time: 48 h - Species: Daphnia magna [Static])

#### 12.2. Persistence and Degradability

Quick Blast – Extra Fast Dissipating Fog	
Persistence and Degradability	Not established.

#### 12.3. Bioaccumulative Potential

Quick Blast – Extra Fast Dissipating Fog	
Bioaccumulative Potential	Not established.

1,2-Propylene glycol (57-55-6)	
BCF fish 1	< 1

12.4. Mobility in Soil No additional information available

#### 12.5. Other Adverse Effects

Other Information : Avoid release to the environment.

### SECTION 13: DISPOSAL CONSIDERATIONS

#### 13.1. Waste treatment methods

Waste Disposal Recommendations: Dispose of waste material in accordance with all local, regional, national, and international regulations.

# Quick Blast – Extra Fast Dissipating Fog

Safety Data Sheet

according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

## SECTION 14: TRANSPORT INFORMATION

In Accordance With ICAO/IATA/IMDG/DOT

**14.1. UN Number** Not regulated for transport

**14.2. UN Proper Shipping Name** Not regulated for transport

**14.3. Additional Information**

**Other information** : No supplementary information available.

**Transport by Sea** Not regulated for transport

**Air Transport** Not regulated for transport

## SECTION 15: REGULATORY INFORMATION

### 15.1 US Federal Regulations

#### Water (7732-18-5)

Listed on the United States TSCA (Toxic Substances Control Act) inventory

#### 1,2-Propylene glycol (57-55-6)

Listed on the United States TSCA (Toxic Substances Control Act) inventory

#### EPA TSCA Regulatory Flag

Y2 - Y2 - indicates an exempt polymer that is a polyester and is made only from reactants included in a specified list of low concern reactants that comprises one of the eligibility criteria for the exemption rule.

### 15.2 US State Regulations

#### 1,2-Propylene glycol (57-55-6)

U.S. - Minnesota - Hazardous Substance List  
U.S. - New Jersey - Right to Know Hazardous Substance List  
U.S. - Pennsylvania - RTK (Right to Know) List  
U.S. - Texas - Effects Screening Levels - Long Term  
U.S. - Texas - Effects Screening Levels - Short Term

## SECTION 16: OTHER INFORMATION

**Revision date** : 10/20/2014

**Other Information** : This document has been prepared in accordance with the SDS requirements of the OSHA Hazard Communication Standard 29 CFR 1910.1200.

*This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product*

SDS US (GHS HazCom) - US



# Techno Fog

## Medium Density Fog Fluid

### Safety Data Sheet

Froggy's Fog LLC  
302 Rutherford Lane  
Columbia, TN 38401  
United States  
Phone: (615) 469-4906

according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

Version: 1.0  
Revision Date: 10/20/2014

#### SECTION 1: IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY

##### 1.1. Product Identifier

**Product Form:** Mixture

**Product Name:** Techno Fog - Medium Density Fog Fluid

##### 1.2. Intended Use of the Product

**Use of the Substance/Mixture:** Theatrical Fog/Haze

##### 1.3. Name, Address, and Telephone of the Responsible Party

Froggy's Fog LLC  
302 Rutherford Lane  
Columbia, TN 38401  
1-615-469-4906

[www.froggysfog.com](http://www.froggysfog.com)

##### 1.4. Emergency Telephone Number

Chemtrec: (800) 424-9300

#### SECTION 2: HAZARDS IDENTIFICATION

##### 2.1. Classification of the Substance or Mixture

**Classification (GHS-US)**

Not classified

##### 2.2. Label Elements

**GHS-US Labeling**

No labeling required

##### 2.3. Other Hazards

**Other Hazards Not Contributing to the Classification:** Exposure may aggravate those with pre-existing eye, skin, or respiratory conditions.

##### 2.4. Unknown Acute Toxicity (GHS-US)

No data available

#### SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

##### 3.1. Substance

Not applicable

##### 3.2. Mixture

Name	Product Identifier	%	Classification (GHS-US)
Water	(CAS No) 7732-18-5	Proprietary	Not classified
Triethylene glycol	(CAS No) 112-27-6	Proprietary	Not classified
1,2-Propylene glycol	(CAS No) 57-55-6	Proprietary	Not classified

The specific chemical identity and/or exact percentage of composition has been withheld as a trade secret.

Full text of H-phrases: see section 16

#### SECTION 4: FIRST AID MEASURES

##### 4.1. Description of First Aid Measures

**First-aid Measures General:** Never give anything by mouth to an unconscious person. If you feel unwell, seek medical advice (show the label where possible).

**First-aid Measures After Inhalation:** When symptoms occur: go into open air and ventilate suspected area. Obtain medical attention if breathing difficulty persists.

**First-aid Measures After Skin Contact:** Remove contaminated clothing. Drench affected area with water for at least 15 minutes. Obtain medical attention if irritation develops or persists.

**First-aid Measures After Eye Contact:** Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Obtain medical attention if pain, blinking or redness persist.

**First-aid Measures After Ingestion:** Rinse mouth. Do NOT induce vomiting. Seek medical attention.

# Techno Fog - Medium Density Fog Fluid

## Safety Data Sheet

according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

### 4.2. Most important symptoms and effects, both acute and delayed

**Symptoms/Injuries:** Not expected to present a significant hazard under anticipated conditions of normal use.

**Symptoms/Injuries After Inhalation:** None expected under normal conditions of use.

**Symptoms/Injuries After Skin Contact:** None expected under normal conditions of use.

**Symptoms/Injuries After Eye Contact:** None expected under normal conditions of use.

**Symptoms/Injuries After Ingestion:** None expected under normal conditions of use.

### 4.3. Indication of Any Immediate Medical Attention and Special Treatment Needed

If you feel unwell, seek medical advice (show the label where possible).

## SECTION 5: FIREFIGHTING MEASURES

### 5.1. Extinguishing Media

**Suitable Extinguishing Media:** Use extinguishing media appropriate for surrounding fire.

**Unsuitable Extinguishing Media:** Do not use a heavy water stream. Use of heavy stream of water may spread fire.

### 5.2. Special Hazards Arising From the Substance or Mixture

**Fire Hazard:** Not flammable.

**Explosion Hazard:** Product is not explosive.

**Reactivity:** Hazardous reactions will not occur under normal conditions.

### 5.3. Advice for Firefighters

**Precautionary Measures Fire:** Exercise caution when fighting any chemical fire.

**Firefighting Instructions:** Use water spray or fog for cooling exposed containers.

**Protection During Firefighting:** Do not enter fire area without proper protective equipment, including respiratory protection.

**Other information:** Do not allow the product to be released into the environment. Do not allow run-off from fire fighting to enter drains or water courses.

## SECTION 6: ACCIDENTAL RELEASE MEASURES

### 6.1. Personal Precautions, Protective Equipment and Emergency Procedures

**General Measures:** Avoid prolonged contact with eyes, skin and clothing. Avoid breathing (vapors, mist, spray).

#### 6.1.1. For Non-emergency Personnel

**Protective Equipment:** Use appropriate personal protection equipment (PPE).

**Emergency Procedures:** Evacuate unnecessary personnel.

#### 6.1.2. For Emergency Responders

**Protective Equipment:** Equip cleanup crew with proper protection.

**Emergency Procedures:** Ventilate area.

### 6.2. Environmental Precautions

Prevent entry to sewers and public waters.

### 6.3. Methods and Material for Containment and Cleaning Up

**For Containment:** Contain any spills with dikes or absorbents to prevent migration and entry into sewers or streams.

**Methods for Cleaning Up:** Clear up spills immediately and dispose of waste safely. Absorb and/or contain spill with inert material, then place in suitable container.

### 6.4. Reference to Other Sections

See heading 8, Exposure Controls and Personal Protection.

## SECTION 7: HANDLING AND STORAGE

### 7.1. Precautions for Safe Handling

**Hygiene Measures:** Handle in accordance with good industrial hygiene and safety procedures. Wash hands and other exposed areas with mild soap and water before eating, drinking, or smoking and again when leaving work.

### 7.2. Conditions for Safe Storage, Including Any Incompatibilities

**Technical Measures:** Comply with applicable regulations.

**Storage Conditions:** Store in a dry, cool and well-ventilated place. Keep container closed when not in use. Keep/Store away from extremely high or low temperatures, direct sunlight, incompatible materials.

**Incompatible Products:** Strong acids. Strong bases. Strong oxidizers.

### 7.3. Specific End Use(s)

Theatrical Fog/Haze.

# Techno Fog - Medium Density Fog Fluid

Safety Data Sheet

according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

## SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

### 8.1. Control Parameters

No Occupational Exposure Limits (OELs) have been established for this product or its chemical components.

### 8.2. Exposure Controls

<b>Appropriate Engineering Controls</b>	: Ensure adequate ventilation, especially in confined areas. Ensure all national/local regulations are observed.
<b>Personal Protective Equipment</b>	: Not generally required. The use of personal protective equipment may be necessary as conditions warrant.
<b>Materials for Protective Clothing</b>	: Chemically resistant materials and fabrics.
<b>Hand Protection</b>	: Wear chemically resistant protective gloves.
<b>Eye Protection</b>	: Chemical goggles or safety glasses.
<b>Respiratory Protection</b>	: Use NIOSH-approved air-purifying or supplied-air respirator where airborne concentrations of vapor or mist are expected to exceed exposure limits.
<b>Other Information</b>	: When using, do not eat, drink or smoke.

## SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

### 9.1. Information on Basic Physical and Chemical Properties

<b>Physical State</b>	: Liquid
<b>Appearance</b>	: Clear.
<b>Odor</b>	: Odorless.
<b>Odor Threshold</b>	: No data available
<b>pH</b>	: Unknown
<b>Relative Evaporation Rate (butylacetate=1)</b>	: No data available
<b>Melting Point</b>	: No data available
<b>Freezing Point</b>	: -19°C (-2.2°F)
<b>Boiling Point</b>	: 99 °C (210.2°F)
<b>Flash Point</b>	: Does not flash
<b>Auto-ignition Temperature</b>	: No data available
<b>Decomposition Temperature</b>	: No data available
<b>Flammability (solid, gas)</b>	: No data available
<b>Vapor Pressure</b>	: No data available
<b>Relative Vapor Density at 20 °C</b>	: No data available
<b>Relative Density</b>	: No data available
<b>Specific Gravity</b>	: Not available
<b>Solubility</b>	: Soluble in water.
<b>Log Pow</b>	: No data available
<b>Log Kow</b>	: No data available
<b>Viscosity, Kinematic</b>	: No data available
<b>Viscosity, Dynamic</b>	: No data available
<b>Explosive Properties</b>	: No data available
<b>Oxidizing Properties</b>	: No data available
<b>Explosive Limits</b>	: Not applicable

### 9.2. Other Information

No additional information available

## SECTION 10: STABILITY AND REACTIVITY

- 10.1 Reactivity:** Hazardous reactions will not occur under normal conditions.
- 10.2 Chemical Stability:** Stable under normal conditions.
- 10.3 Possibility of Hazardous Reactions:** Hazardous polymerization will not occur.
- 10.4 Conditions to Avoid:** Direct sunlight. Extremely high or low temperatures. Incompatible materials.
- 10.5 Incompatible Materials:** Strong acids. Strong bases. Strong oxidizers.
- 10.6 Hazardous Decomposition Products:** Carbon oxides (CO, CO<sub>2</sub>).



# Techno Fog - Medium Density Fog Fluid

## Safety Data Sheet

according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

### SECTION 11: TOXICOLOGICAL INFORMATION

#### 11.1. Information On Toxicological Effects

Acute Toxicity : Not classified

<b>Water (7732-18-5)</b>	
LC50 Inhalation Rat (ppm)	100000 ppm
<b>1,2-Propylene glycol (57-55-6)</b>	
LD50 Oral Rat	20000 mg/kg
LD50 Dermal Rabbit	20800 mg/kg
<b>Triethylene glycol (112-27-6)</b>	
LD50 Oral Rat	15000 mg/kg
LD50 Dermal Rabbit	> 20 ml/kg

**Skin Corrosion/Irritation:** Not classified

pH: unknown

**Serious Eye Damage/Irritation:** Not classified

pH: unknown

**Respiratory or Skin Sensitization:** Not classified

**Germ Cell Mutagenicity:** Not classified

**Carcinogenicity:** Not classified

**Reproductive Toxicity:** Not classified

**Specific Target Organ Toxicity (Single Exposure):** Not classified

**Specific Target Organ Toxicity (Repeated Exposure):** Not classified

**Aspiration Hazard:** Not classified

**Symptoms/Injuries After Inhalation:** None expected under normal conditions of use.

**Symptoms/Injuries After Skin Contact:** None expected under normal conditions of use.

**Symptoms/Injuries After Eye Contact:** None expected under normal conditions of use.

**Symptoms/Injuries After Ingestion:** None expected under normal conditions of use.

### SECTION 12: ECOLOGICAL INFORMATION

#### 12.1. Toxicity

<b>1,2-Propylene glycol (57-55-6)</b>	
LC50 Fish 1	51600 mg/l (Exposure time: 96 h - Species: Oncorhynchus mykiss [static])
EC50 Daphnia 1	10000 mg/l (Exposure time: 24 h - Species: Daphnia magna)
EC50 Other Aquatic Organisms 1	19000 mg/l (Exposure time: 96 h - Species: Pseudokirchneriella subcapitata)
LC 50 Fish 2	41 (41 - 47) mg/l (Exposure time: 96 h - Species: Oncorhynchus mykiss [static])
EC50 Daphnia 2	1000 mg/l (Exposure time: 48 h - Species: Daphnia magna [Static])

<b>Triethylene glycol (112-27-6)</b>	
LC50 Fish 1	56200 - 63700 mg/l (Exposure time: 96 h - Species: Pimephales promelas [flow-through])
EC50 Daphnia 1	42426 mg/l (Exposure time: 48 h - Species: Daphnia magna)
LC 50 Fish 2	10000 mg/l (Exposure time: 96 h - Species: Lepomis macrochirus [static])

#### 12.2. Persistence and Degradability

<b>Techno Fog - Medium Density Fog Fluid</b>	
Persistence and Degradability	Not established.

#### 12.3. Bioaccumulative Potential

<b>Techno Fog - Medium Density Fog Fluid</b>	
Bioaccumulative Potential	Not established.

<b>1,2-Propylene glycol (57-55-6)</b>	
BCF fish 1	< 1

<b>Triethylene glycol (112-27-6)</b>	
Log Pow	-1.98 (at 25 °C)

**12.4. Mobility in Soil** No additional information available

# Techno Fog - Medium Density Fog Fluid

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according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

## 12.5. Other Adverse Effects

**Other Information** : Avoid release to the environment.

## SECTION 13: DISPOSAL CONSIDERATIONS

### 13.1. Waste treatment methods

**Waste Disposal Recommendations:** Dispose of waste material in accordance with all local, regional, national, and international regulations.

## SECTION 14: TRANSPORT INFORMATION

In Accordance With ICAO/IATA/IMDG/DOT

**14.1. UN Number** Not regulated for transport

**14.2. UN Proper Shipping Name** Not regulated for transport

### 14.3. Additional Information

**Other information** : No supplementary information available.

**Transport by Sea** Not regulated for transport

**Air Transport** Not regulated for transport

## SECTION 15: REGULATORY INFORMATION

### 15.1 US Federal Regulations

#### Water (7732-18-5)

Listed on the United States TSCA (Toxic Substances Control Act) inventory

#### 1,2-Propylene glycol (57-55-6)

Listed on the United States TSCA (Toxic Substances Control Act) inventory

#### EPA TSCA Regulatory Flag

Y2 - Y2 - indicates an exempt polymer that is a polyester and is made only from reactants included in a specified list of low concern reactants that comprises one of the eligibility criteria for the exemption rule.

#### Triethylene glycol (112-27-6)

Listed on the United States TSCA (Toxic Substances Control Act) inventory

### 15.2 US State Regulations

#### 1,2-Propylene glycol (57-55-6)

U.S. - Minnesota - Hazardous Substance List  
U.S. - New Jersey - Right to Know Hazardous Substance List  
U.S. - Pennsylvania - RTK (Right to Know) List  
U.S. - Texas - Effects Screening Levels - Long Term  
U.S. - Texas - Effects Screening Levels - Short Term

#### Triethylene glycol (112-27-6)

U.S. - Pennsylvania - RTK (Right to Know) List  
U.S. - Texas - Effects Screening Levels - Long Term  
U.S. - Texas - Effects Screening Levels - Short Term

## SECTION 16: OTHER INFORMATION

**Revision date** : 10/20/2014

**Other Information** : This document has been prepared in accordance with the SDS requirements of the OSHA Hazard Communication Standard 29 CFR 1910.1200.

*This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product*

SDS US (GHS HazCom) - US



# Velocity

## Fast Dissipating Fog

### Safety Data Sheet

Froggy's Fog LLC  
302 Rutherford Lane  
Columbia, TN 38401  
United States  
Phone: (615) 469-4906

according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

Version: 1.0  
Revision Date: 10/20/2014

#### SECTION 1: IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY

##### 1.1. Product Identifier

**Product Form:** Mixture

**Product Name:** Velocity – Fast Dissipating Fog

##### 1.2. Intended Use of the Product

**Use of the Substance/Mixture:** Theatrical Fog/Haze

##### 1.3. Name, Address, and Telephone of the Responsible Party

Froggy's Fog LLC  
302 Rutherford Lane  
Columbia, TN 38401  
1-615-469-4906

[www.froggysfog.com](http://www.froggysfog.com)

##### 1.4. Emergency Telephone Number

Chemtrec: (800) 424-9300

#### SECTION 2: HAZARDS IDENTIFICATION

##### 2.1. Classification of the Substance or Mixture

**Classification (GHS-US)**

Not classified

##### 2.2. Label Elements

**GHS-US Labeling**

No labeling required

##### 2.3. Other Hazards

**Other Hazards Not Contributing to the Classification:** Exposure may aggravate those with pre-existing eye, skin, or respiratory conditions.

##### 2.4. Unknown Acute Toxicity (GHS-US)

No data available

#### SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

##### 3.1. Substance

Not applicable

##### 3.2. Mixture

Name	Product Identifier	%	Classification (GHS-US)
Water	(CAS No) 7732-18-5	Proprietary	Not classified
1,2-Propylene glycol	(CAS No) 57-55-6	Proprietary	Not classified

The specific chemical identity and/or exact percentage of composition has been withheld as a trade secret.

Full text of H-phrases: see section 16

#### SECTION 4: FIRST AID MEASURES

##### 4.1. Description of First Aid Measures

**First-aid Measures General:** Never give anything by mouth to an unconscious person. If you feel unwell, seek medical advice (show the label where possible).

**First-aid Measures After Inhalation:** If symptoms occur: go into open air and ventilate suspected area. Obtain medical attention if breathing difficulty persists.

**First-aid Measures After Skin Contact:** Remove contaminated clothing. Drench affected area with water for at least 15 minutes. Obtain medical attention if irritation develops or persists.

**First-aid Measures After Eye Contact:** Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Obtain medical attention if pain, blinking or redness persists.

**First-aid Measures After Ingestion:** Rinse mouth. Do NOT induce vomiting. Seek medical attention.

# Velocity – Fast Dissipating Fog

Safety Data Sheet

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## 4.2. Most important symptoms and effects, both acute and delayed

**Symptoms/Injuries:** Not expected to present a significant hazard under anticipated conditions of normal use.

**Symptoms/Injuries After Inhalation:** None expected under normal conditions of use.

**Symptoms/Injuries After Skin Contact:** None expected under normal conditions of use.

**Symptoms/Injuries After Eye Contact:** None expected under normal conditions of use.

**Symptoms/Injuries After Ingestion:** None expected under normal conditions of use.

## 4.3. Indication of Any Immediate Medical Attention and Special Treatment Needed

If you feel unwell, seek medical advice (show the label where possible).

## SECTION 5: FIREFIGHTING MEASURES

### 5.1. Extinguishing Media

**Suitable Extinguishing Media:** Use extinguishing media appropriate for surrounding fire.

**Unsuitable Extinguishing Media:** Do not use a heavy water stream. Use of heavy stream of water may spread fire.

### 5.2. Special Hazards Arising From the Substance or Mixture

**Fire Hazard:** Not flammable.

**Explosion Hazard:** Product is not explosive.

**Reactivity:** Hazardous reactions will not occur under normal conditions.

### 5.3. Advice for Firefighters

**Precautionary Measures Fire:** Exercise caution when fighting any chemical fire.

**Firefighting Instructions:** Use water spray or fog for cooling exposed containers.

**Protection During Firefighting:** Do not enter fire area without proper protective equipment, including respiratory protection.

**Other information:** Do not allow the product to be released into the environment. Do not allow run-off from fire fighting to enter drains or water courses.

## SECTION 6: ACCIDENTAL RELEASE MEASURES

### 6.1. Personal Precautions, Protective Equipment and Emergency Procedures

**General Measures:** Avoid prolonged contact with eyes, skin and clothing. Avoid breathing (vapors, mist, spray).

#### 6.1.1. For Non-emergency Personnel

**Protective Equipment:** Use appropriate personal protection equipment (PPE).

**Emergency Procedures:** Evacuate unnecessary personnel.

#### 6.1.2. For Emergency Responders

**Protective Equipment:** Equip cleanup crew with proper protection.

**Emergency Procedures:** Ventilate area.

### 6.2. Environmental Precautions

Prevent entry to sewers and public waters.

### 6.3. Methods and Material for Containment and Cleaning Up

**For Containment:** Contain any spills with dikes or absorbents to prevent migration and entry into sewers or streams.

**Methods for Cleaning Up:** Clear up spills immediately and dispose of waste safely. Absorb and/or contain spill with inert material, then place in suitable container.

### 6.4. Reference to Other Sections

See heading 8, Exposure Controls and Personal Protection.

## SECTION 7: HANDLING AND STORAGE

### 7.1. Precautions for Safe Handling

**Hygiene Measures:** Handle in accordance with good industrial hygiene and safety procedures. Wash hands and other exposed areas with mild soap and water before eating, drinking, or smoking and again when leaving work.

### 7.2. Conditions for Safe Storage, Including Any Incompatibilities

**Technical Measures:** Comply with applicable regulations.

**Storage Conditions:** Store in a dry, cool and well-ventilated place. Keep container closed when not in use. Keep/Store away from extremely high or low temperatures, direct sunlight, incompatible materials.

**Incompatible Products:** Strong acids. Strong bases. Strong oxidizers.

### 7.3. Specific End Use(s)

Theatrical Fog/Haze.

# Velocity – Fast Dissipating Fog

Safety Data Sheet

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## SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

### 8.1. Control Parameters

No Occupational Exposure Limits (OELs) have been established for this product or its chemical components.

### 8.2. Exposure Controls

<b>Appropriate Engineering Controls</b>	: Ensure adequate ventilation, especially in confined areas. Ensure all national/local regulations are observed.
<b>Personal Protective Equipment</b>	: Not generally required. The use of personal protective equipment may be necessary as conditions warrant.
<b>Materials for Protective Clothing</b>	: Chemically resistant materials and fabrics.
<b>Hand Protection</b>	: Wear chemically resistant protective gloves.
<b>Eye Protection</b>	: Chemical goggles or safety glasses.
<b>Respiratory Protection</b>	: Use NIOSH-approved air-purifying or supplied-air respirator where airborne concentrations of vapor or mist are expected to exceed exposure limits.
<b>Other Information</b>	: When using, do not eat, drink or smoke.

## SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

### 9.1. Information on Basic Physical and Chemical Properties

<b>Physical State</b>	: Liquid
<b>Appearance</b>	: Clear.
<b>Odor</b>	: Odorless.
<b>Odor Threshold</b>	: No data available
<b>pH</b>	: Unknown
<b>Relative Evaporation Rate (butylacetate=1)</b>	: No data available
<b>Melting Point</b>	: No data available
<b>Freezing Point</b>	: No data available
<b>Boiling Point</b>	: 100 °C (212°F)
<b>Flash Point</b>	: Does not flash
<b>Auto-ignition Temperature</b>	: No data available
<b>Decomposition Temperature</b>	: No data available
<b>Flammability (solid, gas)</b>	: No data available
<b>Vapor Pressure</b>	: No data available
<b>Relative Vapor Density at 20 °C</b>	: No data available
<b>Relative Density</b>	: No data available
<b>Specific Gravity</b>	: Not available
<b>Solubility</b>	: Soluble in water.
<b>Log Pow</b>	: No data available
<b>Log Kow</b>	: No data available
<b>Viscosity, Kinematic</b>	: No data available
<b>Viscosity, Dynamic</b>	: No data available
<b>Explosive Properties</b>	: No data available
<b>Oxidizing Properties</b>	: No data available
<b>Explosive Limits</b>	: Not applicable

### 9.2. Other Information

No additional information available

## SECTION 10: STABILITY AND REACTIVITY

- 10.1 Reactivity:** Hazardous reactions will not occur under normal conditions.
- 10.2 Chemical Stability:** Stable under normal conditions.
- 10.3 Possibility of Hazardous Reactions:** Hazardous polymerization will not occur.
- 10.4 Conditions to Avoid:** Direct sunlight. Extremely high or low temperatures. Incompatible materials.
- 10.5 Incompatible Materials:** Strong acids. Strong bases. Strong oxidizers.
- 10.6 Hazardous Decomposition Products:** Carbon oxides (CO, CO<sub>2</sub>).

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## SECTION 11: TOXICOLOGICAL INFORMATION

### 11.1. Information On Toxicological Effects

Acute Toxicity : Not classified

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LC50 Inhalation Rat (ppm)	100000 ppm
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LD50 Dermal Rabbit	20800 mg/kg

**Skin Corrosion/Irritation:** Not classified

pH: unknown

**Serious Eye Damage/Irritation:** Not classified

pH: unknown

**Respiratory or Skin Sensitization:** Not classified

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**Reproductive Toxicity:** Not classified

**Specific Target Organ Toxicity (Single Exposure):** Not classified

**Specific Target Organ Toxicity (Repeated Exposure):** Not classified

**Aspiration Hazard:** Not classified

**Symptoms/Injuries After Inhalation:** None expected under normal conditions of use.

**Symptoms/Injuries After Skin Contact:** None expected under normal conditions of use.

**Symptoms/Injuries After Eye Contact:** None expected under normal conditions of use.

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## SECTION 12: ECOLOGICAL INFORMATION

### 12.1. Toxicity

<b>1,2-Propylene glycol (57-55-6)</b>	
LC50 Fish 1	51600 mg/l (Exposure time: 96 h - Species: Oncorhynchus mykiss [static])
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LC 50 Fish 2	41 (41 - 47) mg/l (Exposure time: 96 h - Species: Oncorhynchus mykiss [static])
EC50 Daphnia 2	1000 mg/l (Exposure time: 48 h - Species: Daphnia magna [Static])

### 12.2. Persistence and Degradability

<b>Velocity – Fast Dissipating Fog</b>	
Persistence and Degradability	Not established.

### 12.3. Bioaccumulative Potential

<b>Velocity – Fast Dissipating Fog</b>	
Bioaccumulative Potential	Not established.

<b>1,2-Propylene glycol (57-55-6)</b>	
BCF fish 1	< 1

**12.4. Mobility in Soil** No additional information available

### 12.5. Other Adverse Effects

**Other Information** : Avoid release to the environment.

## SECTION 13: DISPOSAL CONSIDERATIONS

### 13.1. Waste treatment methods

**Waste Disposal Recommendations:** Dispose of waste material in accordance with all local, regional, national, and international regulations.

# Velocity – Fast Dissipating Fog

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## SECTION 14: TRANSPORT INFORMATION

In Accordance With ICAO/IATA/IMDG/DOT

**14.1. UN Number** Not regulated for transport

**14.2. UN Proper Shipping Name** Not regulated for transport

**14.3. Additional Information**

**Other information** : No supplementary information available.

**Transport by Sea** Not regulated for transport

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## SECTION 15: REGULATORY INFORMATION

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#### 1,2-Propylene glycol (57-55-6)

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#### EPA TSCA Regulatory Flag

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#### 1,2-Propylene glycol (57-55-6)

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U.S. - Pennsylvania - RTK (Right to Know) List  
U.S. - Texas - Effects Screening Levels - Long Term  
U.S. - Texas - Effects Screening Levels - Short Term

## SECTION 16: OTHER INFORMATION

**Revision date** : 10/20/2014

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SDS US (GHS HazCom) - US