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

FQ-100 with Atmospheres Stage Fluid
FQ-100 with Atmospheres HQ Fluid

Prepared for:
High End Systems, Inc.

Prepared by:
ENVIRON International Corporation
Groton, Massachusetts

Date:
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Project:
08-26435A

ENVIRON

Contents

1.0 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^3)**.
- Mineral oil should be used in a manner such that an actor's exposure does not exceed a peak concentration of **25 mg/m^3**.
- For chronic exposures to mineral oil, the existing standards established for oil mists (**5 mg/m^3** 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^3**.
- For chronic exposures to glycerol, the existing standards established for glycerin mists (**10 mg/m^3** 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 that have been approved for use in evaluating compliance with the peak guidance levels

is provided on the Theatrical Smoke and Haze Testing page of ENVIRON's web site (http://www.environcorp.com/services/article.php?id=61).

ENVIRON was retained by High End Systems, Inc. to develop calibration factors and time-and-distance guidelines for the following equipment-fluid combinations:

- High End Systems FQ-100 with Atmospheres HQ Fluid (glycol) **AND** Atmospheres Stage Fluid (glycol)

2.0 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 Monitoring Instruments for the Environment, Inc. (MIE). 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^3. In order to be utilized to measure short-term glycol or oil mist 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.

SKC AirLite sampling pumps were used to draw air through collection media. The fluids tested were glycol-based; therefore, 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). This calibration sampling was conducted in conjunction with operating the PDR-1000 aerosol monitor.

The testing was performed at the Performing Arts Center of the Groton Dunstable Regional Middle School in Groton, Massachusetts.

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 (OVS trap for glycols and cassettes for mineral oil and glycerol), and an aerosol monitor. The height of each tripod was approximately five feet, corresponding with the breathing zone of a typical actor. 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.

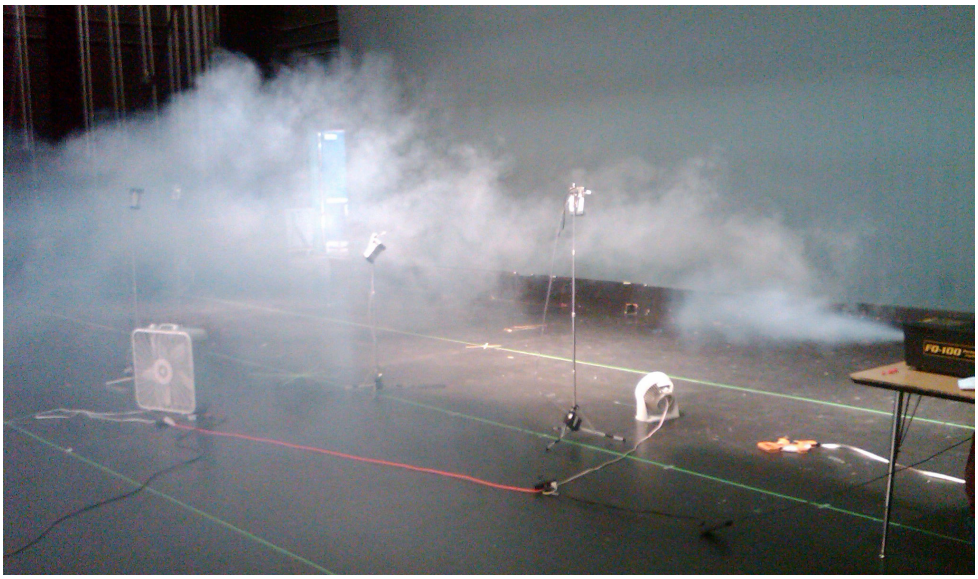
a. The sampling pumps were calibrated to 2 liters per minute (LPM) using a BIOS DryCal pump calibrator. The aerosol monitors were zeroed, the data logging function of the aerosol monitor was turned on, and the data logging times for all of the aerosol monitors were synchronized.

b. The fog machines were positioned on a bench to allow a release of fog at a height of four to five feet. 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 two and four minutes, the machines and pumps were simultaneously turned off.

d. The OVS traps were capped and labeled to identify the type of fog machine, glycol fluid, sampling location, and other sampling specifics. After being capped and labeled, the OVS traps were placed in a cooler with ice packs.

e. Various fans 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 30.0 micrograms (μg) of each individual glycol per sample.

2.4 Time-and-Distance Monitoring Procedure

To measure the levels of glycol present at different distances from the release point, a series of five tripods equipped with aerosol monitors positioned at breathing height (approx. 5ft above ground) were used. The FQ-100 was turned on for durations ranging from 5 to 30 seconds, allowing sustained fog generation to occur, and then turned off. The five tripods were then immediately placed within the fog plume at distances ranging from six to 18 feet from the FQ-100 release point. The aerosol monitors collected logged data on the fog levels as the concentrations gradually dissipated.

3.0 Results and Discussion

3.1 Aerosol Monitor Calibration

Total glycol concentrations were calculated from the analytical data. 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 glycol fluid, the average aerosol monitor readings during the period of time in which air was drawn through the OVS trap for each air sample were calculated and plotted against the total glycol concentration data.

The calibration curves for the four equipment-fluid combinations tested are shown in Figures 1 and 2. First order regression curves are also shown on these figures. The calibration factors, calculated from the slopes of these regressions, are summarized in Table 1.

Table 1: Summary of Calibration Factors

Manufacturer	Machine	Fluid	Fluid Type	Calibration Factor
HES	FQ-100	Atmospheres HQ	Glycol	1.30
HES	FQ-100	Atmospheres Stage	Glycol	0.96

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^3

C = aerosol monitor calibration factor (mg/m^3)/ (mg/m^3 aerosol)

PDR = aerosol monitor reading, mg/m^3 aerosol

For example, an uncalibrated reading of 100 mg/m^3 on the aerosol monitor would correspond to a glycol concentration of 130 mg/m^3 for FQ-100 / HQ. These calculated concentrations can then be compared with the peak guidance levels. The peak guidance level for glycols of 40 mg/m^3 would correspond to an uncalibrated aerosol monitor reading of 30.8 mg/m^3 for the FQ-100 / HQ combination.

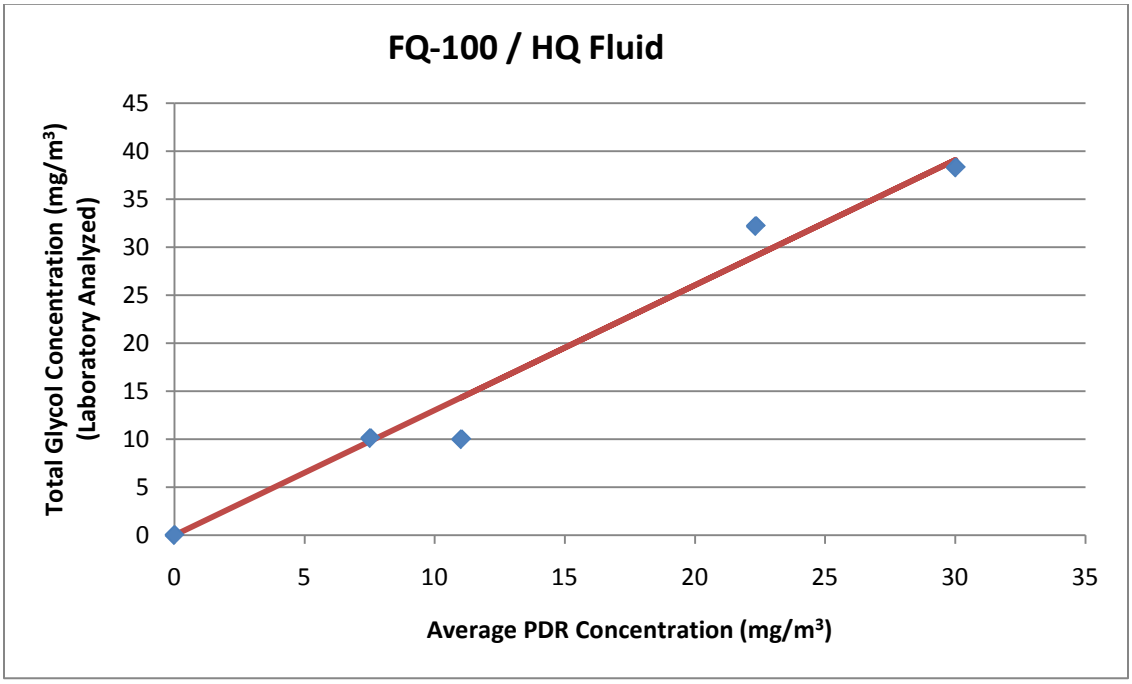


Figure 1. Calibration curve for Atmospheres HQ Fluid in FQ-100. Calibration factor, based on slope of curve, is 1.30 (mg/m3 glycol)/ (mg/m3 aerosol).

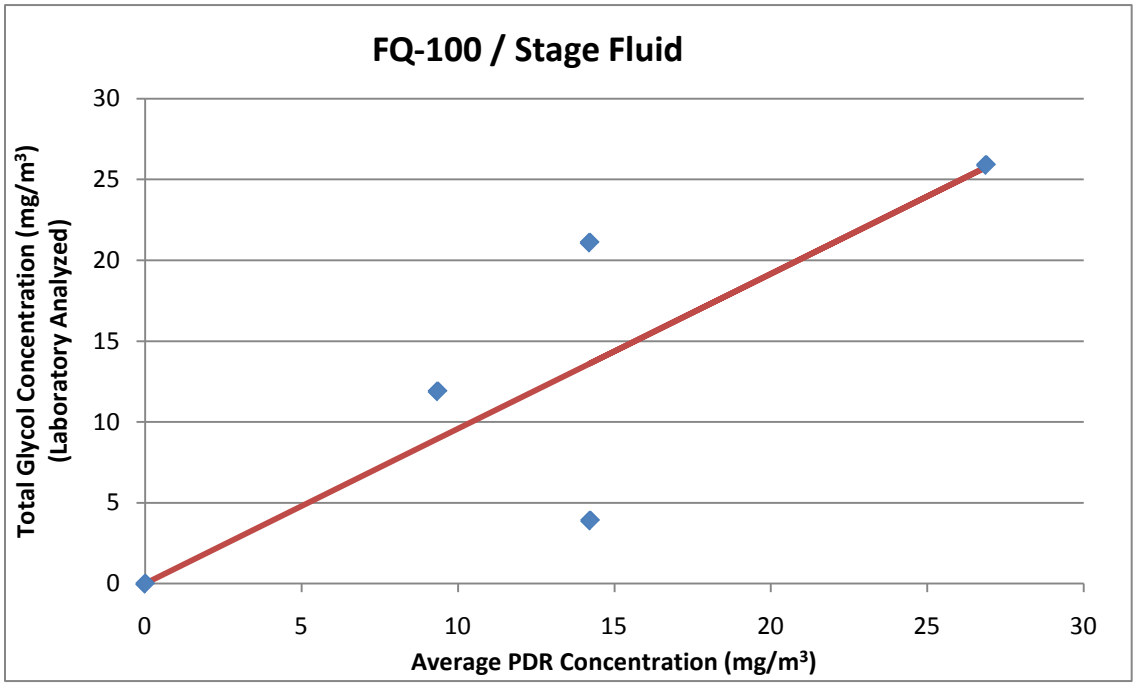


Figure 2. Calibration curve for Atmospheres Stage Fluid in FQ-100. Calibration factor, based on slope of curve, is 0.96 (mg/m3 glycol)/ (mg/m3 aerosol).

3.3 Time-and-Distance Guidelines

For various distances from the cue release point, Tables 2 and 3 provide 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 Tables 2 and 3 has elapsed following the end of the cue. For example, if a production is using the FQ-100 operating at 99% fog output with 15-second cue duration, an actor should not be situated within three feet from the front of the cue release point until at least 30 seconds following the end of the cue release.

It should be reiterated that the Time-and-Distance Guidelines provided in Tables 2 and 3 are intended to allow a production to use the FQ-100 without conducting monitoring. However, these Guidelines may not be appropriate for all productions. Tables 2 and 3 are based on the FQ-100 being positioned approximately three above the ground, and being operated to achieve 5 to 15 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.

TABLE 2
Summary of Time-and-Distance Guidelines for Fog Generation FQ-100 with Atmospheres HQ Fluid

Release Duration (secs)	Time (in sec) After Which Air Concentrations Are Below Guidance Level (40 mg/m^3)					
	Machine Setting	6 ft	9 ft	12 ft	15 ft	18 ft
5	75	60	60	60	60	60
15	75	100	100	100	100	90
5	50	60	60	60	60	60
15	50	100	100	100	100	90
5	25	60	60	60	60	60
15	25	60	60	60	60	60
30	25	80	80	80	80	80

TABLE 3
Summary of Time-and-Distance Guidelines for Fog Generation FQ-100 with Atmospheres Stage Fluid

Release Duration (secs)	Time (in sec) After Which Air Concentrations Are Below Guidance Level (40 mg/m^3)					
	Machine Setting	6 ft	9 ft	12 ft	15 ft	18 ft
5	99	100	100	100	100	80
15	99	100	100	100	100	80
5	75	80	80	80	80	80
15	75	90	90	90	90	80
5	50	80	80	80	80	80
15	50	90	90	90	90	80
5	25	0	0	0	0	0
15	25	90	90	90	90	80

4.0 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.

ENVIRON International Corporation (ENVIRON). 2001b. Theatrical Haze and Fog Testing for Mamma Mia!, Winter Garden Theatre. Prepared for Mamma Mia! Broadway and Nina Lannan Associates. November 12.

Mount Sinai School of Medicine and ENVIRON International Corporation (Mt. Sinai and ENVIRON). 2000. Health effects evaluation of theatrical smoke, haze, and pyrotechnics. Prepared for Equity-League Pension and Health Trust Funds. June 6.

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:
Technical Specifications

FQ-100

User-friendly, high-performance fog generator

Continuing the benchmark set by the original F-100™

Key benefits

- LCD digital menu system
- DMX input and manual timer controls
- Large 9.5 liter (2.5 gallon) removable fluid reservoir
- Industry standard fog generator
- Safe Atmospheres fluid

The FQ-100™ performance fog generator is designed to meet the rigorous demands of the nightclub, theatrical and touring industries. Building on the technology as well as the strong legacy of the F-100™ industry standard fog generator, it produces any atmosphere from dense fog to fine mist.

In addition, the FQ-100's Atmospheres® Fog Generating fluid is specially formulated to provide a dense, safe, water-based fog of a fine particulate size. The FQ-100's safe and ergonomic operation is further augmented by its low noise levels, which make it ideal for theatrical and studio work.

FQ-100™ also includes an internal LCD digital menu system. This allows you to set the volume control, timer control and DMX functions quickly and easily.

Features

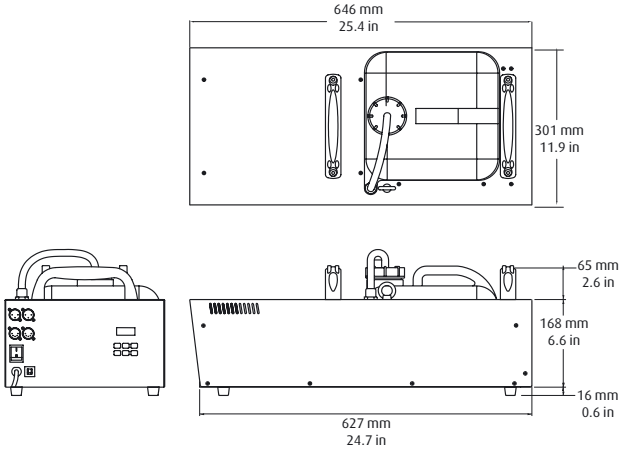
- A large 9.5 liter (2.5 gallon) removable fluid reservoir for extended use
- Atmospheres® scientifically formulated fluid provides optimum particulate size for lighting applications
- LCD menu:
  - timer with interval, duration, and volume
  - set DMX
  - continuous fogging
  - manual on/off
- 3-pin and 5-pin XLR DMX in/out connectors
- Fluid level sight gauge
- User replaceable fluid filter

Output

- 20,000 cu.ft (566m³) / min output
- 10 min / 1 liter fluid consumption rate
- 11 minutes warm-up time
- Opto-electronic liquid sensor with auto shut-off

Construction

- Low-maintenance, corrosion-resistant vaporizing chamber
- Dual carrying handles
- Safety cable mounting point



Power

- Power consumption: 1500W
- 100-120 VAC 50/60 Hz or 200-240 VAC 50/60 Hz

Fluid Types

- HQ
- Stage

Mechanical

- Weight: 15.5 kg (34 lbs.)
- Dimensions (WxHxL): 301 x 168 x 646 mm (11.85 x 6.6 x 25.4 inch)

M00318-R00-0110-DS

2105 Gracy Farms Lane
Austin, Texas 78758, USA
T +1 512 836 2242 - F +1 512 837 5290

FQ-100 Performance Fog Generator

Technical Data Sheet
Revised 01/22/10

MECHANICAL SPECIFICATIONS

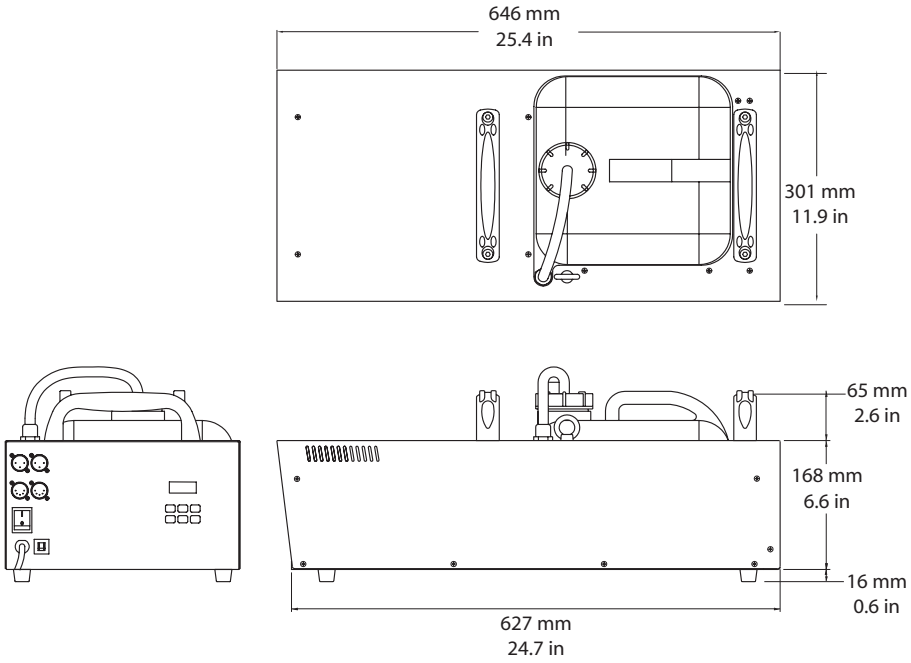
FIXTURE	BOXED FOR SHIPPING
Dimensions:	**Dimensions:**
mm: 646 x 301 x 168	**mm:** 740 x 410 x 602
in: 25.4 x 11.9 x 6.6	**in:** 29.0 x 16.1 x 23.7

Fixture Weight: 15.5 kg (34 lb)

Shipping Weight: 19 kg (42 lb)

Construction and Mounting Information: This product is constructed with a low-maintenance, corrosion-resistant vaporizing chamber and dual carrying handles. A safety cable mounting point can be used in securing the unit when strapped to a truss.

Colors Available: Black



ELECTRICAL SPECIFICATIONS

Power Consumption: 100 - 120 VAC 50/60 Hz or
200-240 VAC 50/60 HZ

Rated Power: 1500 W maximum

OUTPUT

Fluid capacity: 9.5 liter (2.5 gal) fluid reservoir

Minimum Output: 566 m^3 (20,000 ft^3)

Warm-up Time: 11 min

Liquid Sensor: Optoelectronic with auto shutoff

Fluid Type: Water-based Atmospheres ® fine particulate fog generating fluid. HQ, Stage

OPERATION

Menu Interface: Timer to set interval and duration
DMX Channel setting
Continuous fogging setting
Volume control
Manual ON/OFF
LCD Display

Compliance: ROHS, TUV 499 (UL standard)

Environmental Specifications: Minimum ambient temperature -5° C (23°F)
Maximum ambient temperature 50°C (122°F)

DMX CONTROL

DMX Control: DMX-512

DMX Channel Requirement: One

Address Methods: Menu Display

DMX/RDM Data Connectors: 3-pin and 5-pin male and female XLR connectors

PART NUMBERS

15010014: FOGGER, FQ-100 110V
15010015: FOGGER, FQ-100 230V

05040001: Atmospheres Liquid, 2.11 Gal HQ
05040002: Atmospheres, 5 Gal HQ
05040004: Atmospheres, 2.11 Gal Stage

05040005: Atmospheres, 5 Gal Stage
05040018: Atmospheres, 55 Gal Stage
05040019: Atmospheres, 55 Gal HQ

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Appendix B:
Material Safety Data Sheets

Atmospheres HQ Fluid
Atmospheres Stage Fluid

High End Systems
2105 Gracy Farms Lane
Austin, Texas U.S.A.78758
Phone: 512.836.2242
Fax: 512.837.5290
www.highend.com

Material Safety Data Sheet

Effective Date: 07/18/07

High End Systems urges each customer or recipient of this MSDS to study it carefully to become aware of and understand the hazards associated with the product. The reader should consider consulting reference works or individuals who are experts in ventilation, toxicology, and fire prevention, as necessary or appropriate to use and understand the data contained in this MSDS.

To promote safe handling, each customer or recipient should: (1) notify its employees, agents, contractors and others whom it knows or believes will use this material of the information in this MSDS and any other information regarding hazards or safety; (2) furnish this same information to each of its customers for the products; and (3) request its customers to notify their employees, customers, and other users of the product of this information.

I. IDENTIFICATION

PRODUCT NAME: "Atmospheres" HQ Light Enhancement Fluid ("Stage" and "Coldflow" formulas contain different percentages of the CAS#'s and a higher percentage of water)

FORMULA: Food grade or high purity grade propylene glycol, triethylene glycol and de-ionized water

II. PHYSICAL DATA

CAS# 57-55-6 and 112-27-6

BOILING POINT (760 mm Hg): 212-470×F

MELTING POINT: Not applicable

SPECIFIC GRAVITY (H20=1) : 1.082 AT 20×C

VAPOR PRESSURE AT 20×C: <.025mm Hg

VAPOR DENSITY (air=1): 3.9

SOLUBILITY IN WATER: Complete @ 70×F

EVAPORATION RATE(Butyl Acetate=1): .003

APPEARANCE AND ODOR: Water-white liquid, mild odor

III. INGREDIENTS

This product is a mixture of very low toxicity ingredients which are of high purity or food grade. According to OSHA this product is non-hazardous under (1910.1200). The largest single component of this product is de-ionized water.

			ACGIH TLV		OSHA PEL	
Ingredients	CAS #	% (weight)	TWA	STEL	PEL	STEL
Triethylene glycol	112-27-6	N/Av	N/Av	N/Av	N/Av	N/Av
Propylene glycol	57-55-6	N/Av	10 mg/m3	N/Av	50 ppm(total); 10 mg/m3 (aerosol)	N/Av
Deionized water	N/Av	N/Av	N/Av	N/Av	N/Av	N/Av

Note: The ACGIH TLV listed above for the following ingredient(s) is an AIHA WEEL: Propylene glycol.

IV. FIRE AND EXPLOSION HAZARD DATA

FLASH POINT: No flash point by Cleveland Open Cup and Penskey-Martin Closed Cup due to the fact that this is primarily a water based formula

AUTOIGNITION TEMP: Not Determined

FLAMMABLE LIMITS IN AIR % BY VOLUME: Not Determined

EXTINGUISHING MEDIA: Water spray or all purpose foams by manufacturers' recommended techniques for large fires. Use CO2 or dry chemical media for small fires.

UNUSUAL FIRE AND EXPLOSION HAZARDS: None

V. HEALTH HAZARD DATA

EFFECTS OF SINGLE OVEREXPOSURE:

SWALLOWING: No evidence of adverse effect for low dose. May cause nausea and vomiting in higher dosage.

INHALATION: No evidence of adverse effects from exposure to recommended levels. Should continuous exposure to high concentrations of fog be required professionally (i.e. fire training), a canister type particle mask designed for 10 to 20 micron filtration should be used.

SKIN CONTACT: May cause minimal irritation of areas exposed to liquid.

EYE CONTACT: If splashed in eyes, may cause minimal irritation seen as slight excess redness of the conjunctiva.

EFFECTS OF REPEATED OVEREXPOSURE: No evidence of adverse effects from available information.

MEDICAL CONDITIONS AGGRAVATED BY OVEREXPOSURE: A knowledge of the available toxicology information and of the physical and chemical properties of the material suggests that overexposure is unlikely to aggravate existing medical conditions.

EYES: Flush with water.

NOTES TO PHYSICIAN: Treatment of overexposure should be directed at the control of symptoms and the clinical condition.

VI. REACTIVITY DATA

This material is known to be stable and does not react violently with any of the following: Air, Water, Heat, Strong Oxidizers.

HAZARDOUS COMBUSTION OR DECOMPOSITION PRODUCTS: Burning under certain conditions can produce aldehydes, ketones, carbon dioxide and / or carbon monoxide.

HAZARDOUS POLYMERIZATION: Hazardous polymerization will not occur.

CONDITIONS TO AVOID: None

VII. SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IF MATERIAL IS RELEASED OR SPILLED: Small spills should be flushed with large quantities of water. Larger spills should be collected for disposal.

WASTE DISPOSAL METHOD: Dispense as permitted under appropriate Federal and State regulations.

VIII. SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION (specify type): None required under normal conditions of use.* For repeated professional usage, see V (inhalation)

VENTILATION: General (mechanical) room ventilation

PROTECTIVE GLOVES: Rubber or polyvinyl chloride coated.

EYE PROTECTION: Protect eyes from liquid with safety glasses

IX. SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE: Normal precautions common to good manufacturing practice should be followed in handling and storage. Avoid repeated contact with skin and clothing. This product is intended for professional use only and should be kept out of the reach of children.

X. REGULATORY INFORMATION

The criteria for listing components in the composition section is as follows:

Carcinogens are listed when present at 0.1% or greater; components which are otherwise hazardous according to OSHA are listed when present at 1.0% or greater; non-hazardous components are listed at 3.0% or greater.

Product and/or Component(s) Carcinogenic According to:

OSHA	IARC	NTP	OTHER	NONE
_____	_____	_____	_____	__X__

PRODUCT IS NON-HAZARDOUS ACCORDING TO OSHA (1910.1200)

Federal Regulations:

SARA Title III:

Section 302/304 Extremely Hazardous Substances

Seq.	Chemical Name	CAS Number	Range in %

None

Section 311 Hazardous Categorization:

Acute	Chronic	Fire	Pressure	Reactive	N/A
_____	_____	____	_____	_____	_X__

Section 313 Toxic Chemical

Chemical Name	CAS Number	Concentration in %

None

CERCLA 102 (a) / DOT Hazardous Substances: (+ indicates DOT Hazardous Substance)

Seq.	Chemical Name	CAS Number	Range in %

None

CERCLA / DOT Hazardous Substances (Sequence Numbers and RQ's):

Seq.	Chemical Name	CAS Number	Range in %

None

TSCA Inventory Status: This product is listed on the Toxic Substance Control Act (TSCA) Chemical Substance inventory.

State Regulations:

California Proposition 65: The following detectable components of this product are substances, or belong to classes or substances, known to the State of California to cause cancer and/or reproductive toxicity.

Chemical Name	CAS Number

None

States Right-to-know Regulations:

Chemical State Right-to-know

CAS # 57-55-6, 112-27-6 PA, RI

State list:

CT (Connecticut), FL (Florida), IL (Illinois), MI (Michigan), LA (Louisiana), MA (Massachusetts), NJ (New Jersey), PA (Pennsylvania), RI (Rhode Island

Note: The ACGIH TLV listed above for the following ingredient(s) is an AIHA WEEL: Propylene glycol.

International Regulations

WHMIS Classification: Not Regulated

Canada Inventory Status: All components are listed on the Canadian Domestic Substance List (DSL).

EINECS Inventory Status: All components are listed on the European Inventory of Existing Chemical Substances (EINECS).

Australia Inventory Status: All components are listed on the Australian Inventory of Chemical Substances (ACIS).

Japan Inventory Status: All components are listed on the Japanese MITI inventory.

Note: The opinions expressed herein are those of qualified experts within the field of Toxicology, Chemistry, and Information Specialists. These include results of independent scientific studies and Toxicology reports. We believe that the information contained herein is current as of the date of the Material Safety Sheet. Since the use of this information and of these opinions and the conditions of the use of the product are not within the control of High End Systems, it is the user's obligation to determine the conditions of safe use of the product.