

# THEATRICAL SMOKE, FOG, AND HAZE TESTING TIME AND DISTANCE GUIDELINES

In the absence of other information, theater-specific monitoring would be required to evaluate whether smoke/fog/haze machines are being used in accordance with the peak exposure guidelines. Ramboll (formerly ENVIRON) developed Time-and-Distance (T&D) Guidelines as an alternative to conducting theater- and production-specific monitoring. These T&D Guidelines were developed under conservative use assumptions (e.g., no on-stage activities or props that would enhance dispersion, cue release at breathing height level). By following these T&D Guidelines, a production can use fog effects without having to conduct its own stage-specific testing, provided the machines are used in accordance with manufacturer specifications, are well maintained, and are functioning properly. These T&D Guidelines have been approved by Actors' Equity Association and the Broadway League for use in productions that use theatrical smoke, fog and haze.

The following tables describe the distance (with respect to the discharge point on the equipment) and length of time that concentrations exceeding the peak guidance levels would be expected to occur. Thus, by arranging the blocking and choreography such that an actor is not situated within the restricted areas during the times specified in these tables, actors should not receive exposures above the peak exposure guidelines.

The Time and Distance Guidelines are applicable for one single cue from one machine/fluid combination at a time. If a production wants to use more than one cue and/or more than one machine/fluid simultaneously, production-specific testing will be necessary using the Calibration Factors list and the Air-Sampling Protocol.

It should be noted that these T&D Guidelines may not be appropriate for all productions. Productions may want to use different configurations for positioning the machines (e.g., different heights), provide enhanced on-stage ventilation, or generate fog for a longer or shorter 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 T&D 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.

**For more information, please contact:**

Alan Kao, Principal  
Ramboll  
15 Broad Street, Suite 501  
Boston, MA 02109  
+1 617.946.6113  
akao@ramboll.com

Disclaimer: These guidelines do not represent an endorsement of any equipment-fluid combination by Ramboll. Please note that the use of fluids in machines other than those recommended by the manufacturer is subject to the equipment manufacturer's terms and conditions.

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**AMERICAN DJ SUPPLY, INC.**

TIME-AND-DISTANCE GUIDELINES Fog Fury 3000							
Fluid	Machine Setting	Release Duration (sec)	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
Froggy's Fog Backwood Bay Fluid	Full	5	50	40	40	40	30
	Full	15	50	40	40	40	30
Froggy's Fog Bog Fog Fluid	Full	5	80	60	40	0	0
	Full	15	130	130	130	40	30
Froggy's Fog Velocity Fluid	Full	5	20	20	0	0	0
	Full	15	30	30	30	0	0
Froggy's Fog Cryo Freeze Fluid	Full	5	20	20	0	0	0
	Full	15	30	30	30	0	0
Froggy's Fog Quick Blast Fluid	Full	5	20	20	0	0	0
	Full	15	30	30	30	0	0

Reference: [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, Velocity/Cryo Freeze/Quick Blast/Training Smoke Q, Techno Fog/Beam Splitter, Neutronic Haze, DaFiddy, Swamp Juice 2009 Formula, Light Fog](#), prepared by ENVIRON International Corporation for Froggy's Fog, November 2014.

TIME-AND-DISTANCE GUIDELINES Fog Storm 1700 HD with Froggy's Fog Velocity Fluid							
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
Froggy's Fog Velocity Fluid	5	Full	20	10	10	0	0
	15	Full	20	20	20	20	0
	30*	Full	20	20	20	20	0
Froggy's Fog Cryo Freeze Fluid	5	Full	20	10	10	0	0
	15	Full	20	20	20	20	0
	30*	Full	20	20	20	20	0
Froggy's Fog Quick Blast Fluid	5	Full	20	10	10	0	0
	15	Full	20	20	20	20	0
	30*	Full	20	20	20	20	0

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

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

Reference: [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, Velocity/Cryo Freeze/Quick Blast/Training Smoke Q, Techno Fog/Beam Splitter, Neutronic Haze, DaFiddy, Swamp Juice 2009 Formula, Light Fog](#), prepared by ENVIRON International Corporation for Froggy's Fog, October 2014.



**ANTARI**

<b>TIME-AND-DISTANCE GUIDELINES</b>						
<b>1520 RGB Upshot with Froggy's Fog Quick Blast 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	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

Reference: [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, Velocity/Cryo Freeze/Quick Blast/Training Smoke Q, Techno Fog/Beam Splitter, Neutronic Haze, DaFiddy, Swamp Juice 2009 Formula, Light Fog](#), prepared by ENVIRON International Corporation for Froggy's Fog, October 2014.

<b>TIME-AND-DISTANCE GUIDELINES</b>					
<b>Antari CH-1 Cinema Hazer with Antari CHL-2 Fluid</b>					
<b>Release Duration (seconds)</b>	<b>Output (%)</b>	<b>Time (in seconds) After End of Cue After Which Air Concentrations Are Below Guidance Level (40mg/m<sup>3</sup>)</b>			
		<b>Distance From Machine</b>			
		<b>4 ft</b>	<b>8 ft</b>	<b>12 ft</b>	<b>16 ft</b>
180	100	70	70	70	0
300	100	40	40	0	0
180	75	30	30	0	0
300	75	30	30	0	0

Reference: [Environmental Testing of Theatrical Fog Equipment: DNG-250 Low Fogger with FLL Low Fog Fluid and CH-1 Cinema Hazer with CHL-2 Fluid](#), prepared by Ramboll, April 2023.

**ANTARI**

<b>TIME-AND-DISTANCE* GUIDELINES</b>						
<b>Antari DNG-200 Low Fog with Antari FLC Fog Fluid</b>						
<b>Release Duration</b>	<b>Time (in sec) After Which Air Concentrations Are Below Guidance Level (40 mg/m<sup>3</sup>)</b>					
<b>(secs)</b>	<b>Machine Setting</b>	<b>3 in</b>	<b>6 in</b>	<b>18 in</b>	<b>36 in</b>	<b>48 in</b>
30	High	40	20	0	0	0
60	High	60	0	0	0	0
100**	High	70	0	0	0	0
30	Medium	10	0	0	0	0
60	Medium	20	0	0	0	0
100	Medium	0	0	0	0	0
30	Low	0	0	0	0	0
60	Low	0	0	0	0	0
100	Low	0	0	0	0	0

\*All concentrations are measured at same horizontal distance from machine (approximately 6 feet).  
\*\*Machine shut off after ~70 seconds

Reference: Environmental Testing of Theatrical Fog Equipment: Antari F-1 Fazer, F-4 Fazer, F-7 Smaze, X-380 Fazer, M-8, W-515D, W-715x Fog Jet, and DNG-200 Low Fog, prepared by Ramboll Environ, December 2017.

**ANTARI**

TIME-AND-DISTANCE GUIDELINES DNG-200 with Froggy's Fog Cryo Freeze Fluid							
Measurement Direction	Release Duration (secs)	Time (in sec) After Which Air Concentrations Are Below Guidance Level (40 mg/m <sup>3</sup> )					
		Machine Setting	5 ft	8 ft	12 ft	16 ft	20 ft
Horizontal	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
*Machine takes 10 seconds to release fog after turned on <sup>†</sup> Machine shuts off after 100 seconds							
Vertical**	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
**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							
Reference: <u>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, Velocity/Cryo Freeze/Quick Blast/Training Smoke Q, Techno Fog/Beam Splitter, Neutronic Haze, DaFiddy, Swamp Juice 2009 Formula, Light Fog</u> , prepared by ENVIRON International Corporation for Froggy's Fog, October 2014.							

**ANTARI**

<b>TIME-AND-DISTANCE GUIDELINES Antari DNG-250 Low Fog with Antari FLL Fog Fluid</b>					
<b>Release Duration (seconds)</b>	<b>Output (%)</b>	<b>Time (in seconds) After End of Cue After Which Air Concentrations Are Below Guidance Level (40mg/m<sup>3</sup>)</b>			
		<b>Height Above Ground</b>			
		<b>12 in</b>	<b>20 in</b>	<b>24 in</b>	<b>4 ft</b>
30	100	50	0	0	0
60	100	110	0	0	0
30	75	70	0	0	0
60	75	80	0	0	0
30	50	80	0	0	0
60	50	60	0	0	0
300	100	Not Measured	Not Measured	Not Measured	0

Reference: [Environmental Testing of Theatrical Fog Equipment: DNG-250 Low Fogger with FLL Low Fog Fluid and CH-1 Cinema Hazer with CHL-2 Fluid](#), prepared by Ramboll, April 2023.

<b>TIME-AND-DISTANCE GUIDELINES Antari F-1 Fazer with Antari FLG Fog Fluid</b>							
<b>Release Duration (secs)</b>	<b>Fan Speed</b>	<b>Output Setting</b>	<b>Time (in sec) After Which Air Concentrations Are Below Guidance Level (40mg/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>
30	100	100	20	20	0	0	0
60	100	100	20	0	0	0	0
120	100	100	20	20	20	0	0
60	100	65	10	10	0	0	0
120	100	65	10	10	0	0	0
30	50	100	0	0	0	0	0
60	50	100	20	0	0	0	0
120	50	100	20	20	0	0	0
60	50	65	40	40	0	0	0
120	50	65	40	40	0	0	0
60	20	100	20	0	0	0	0
120	20	100	20	20	0	0	0
60	20	65	0	0	0	0	0
120	20	65	20	20	0	0	0

Reference: [Environmental Testing of Theatrical Fog Equipment: Antari F-1 Fazer, F-4 Fazer, F-7 Smaze, X-380 Fazer, M-8, W-515D, W-715x Fog Jet, and DNG-200 Low Fog](#), prepared by Ramboll Environ, December 2017.

**ANTARI**

TIME-AND-DISTANCE GUIDELINES Antari F-4 Fazer with Antari FLG Fog 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	10	10	0	0	0
60	100	100	20	20	0	0	0
120	100	100	30	30	30	30	30
30	100	65	20	20	0	0	0
60	100	65	20	20	0	0	0
120	100	65	30	30	30	0	0
30	50	100	20	10	0	0	0
60	50	100	20	20	0	0	0
120	50	100	20	20	20	20	0
30	50	65	20	20	0	0	0
60	50	65	20	20	0	0	0
120	50	65	20	20	20	0	0
30	20	100	20	20	0	0	0
60	20	100	20	20	0	0	0
120	20	100	20	20	0	0	0
30	20	65	10	10	0	0	0
60	20	65	20	20	0	0	0
120	20	65	20	20	20	0	0

Reference: Environmental Testing of Theatrical Fog Equipment: Antari F-1 Fazer, F-4 Fazer, F-7 Smaze, X-380 Fazer, M-8, W-515D, W-715x Fog Jet, and DNG-200 Low Fog, prepared by Ramboll Environ, December 2017.

**ANTARI**

TIME AND DISTANCE GUIDELINES							
F-5/F-5D Fazer with Froggy's Fog Faze Haze 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	Fan 100	100	0	0	0	0	0
60	Fan 100	100	10	10	10	0	0
120	Fan 100	100	10	10	10	0	0
30	Fan 100	65	0	0	0	0	0
60	Fan 100	65	0	0	0	0	0
120	Fan 100	65	0	0	0	0	0
30	Fan 100	25	0	0	0	0	0
60	Fan 100	25	0	0	0	0	0
120	Fan 100	25	0	0	0	0	0
30	Fan 50	100	10	10	10	0	0
60	Fan 50	100	20	20	20	0	0
120	Fan 50	100	20	20	20	0	0
30	Fan 50	65	10	10	10	0	0
60	Fan 50	65	10	10	10	0	0
120	Fan 50	65	10	10	10	0	0
30	Fan 20	100	30	30	30	0	0
60	Fan 20	100	30	30	30	0	0
120	Fan 20	100	30	30	30	0	0
30	Fan 20	65	30	30	30	0	0
60	Fan 20	65	30	30	30	0	0
120	Fan 20	65	30	30	30	0	0

Reference: 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, Velocity/Cryo Freeze/Quick Blast/Training Smoke Q, Techno Fog/Beam Splitter, Neutronic Haze, DaFiddy, Swamp Juice 2009 Formula, Light Fog, prepared by ENVIRON International Corporation for Froggy's Fog, October 2014.

**ANTARI**

TIME AND DISTANCE GUIDELINES Antari F-7 Smaze with Antari FLG Fog Fluid							
Release Duration (secs)	Fan Speed	Output Setting	Time (in sec) After Which Air Concentrations Are Below Guidance Level (40mg/m <sup>3</sup> )				
			5 ft	10 ft	15 ft	20 ft	25 ft
30	100	100	10	10	10	10	10
60	100	100	10	10	10	10	10
120	100	100	10	10	10	10	10
30	100	65	10	10	10	10	10
60	100	65	10	10	10	10	10
120	100	65	10	10	10	10	10
30	50	100	30	30	30	30	10
60	50	100	30	30	30	30	10
120	50	100	30	30	30	30	10
30	50	65	20	20	20	20	20
60	50	65	20	20	20	20	20
120	50	65	20	20	20	20	20
30	20	100	40	40	10	0	0
60	20	100	40	40	10	0	0
120	20	100	50	50	10	0	0
30	20	65	0	0	0	0	0
60	20	65	30	30	30	0	0
120	20	65	30	30	30	0	0

Reference: Environmental Testing of Theatrical Fog Equipment: Antari F-1 Fazer, F-4 Fazer, F-7 Smaze, X-380 Fazer, M-8, W-515D, W-715x Fog Jet, and DNG-200 Low Fog, prepared by Ramboll Environ, December 2017.

ANTARI

TIME-AND-DISTANCE GUIDELINES ICE with Froggy's Fog Cryo Freeze Fluid							
Measurement Direction	Release Duration (secs)	Time (in sec) After Which Air Concentrations Are Below Guidance Level (40 mg/m <sup>3</sup> )					
		Machine Setting	5 ft	8 ft	12 ft	16 ft	20 ft
Horizontal	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							
Vertical**	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							
Reference: <a href="#">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, Velocity/Cryo Freeze/Quick Blast/Training Smoke Q, Techno Fog/Beam Splitter, Neutronic Haze, DaFiddy, Swamp Juice 2009 Formula, Light Fog</a> , prepared by ENVIRON International Corporation for Froggy's Fog, October 2014.							



**ANTARI**

TIME-AND-DISTANCE GUIDELINES							
M-5							
Fluid	Machine Setting	Release Duration (sec)	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
Froggy's Fog Backwood Bay Fluid	100	5	90	90	90	90	90
	100	15	90	90	90	90	90
	100	30*	90	90	90	90	90
	65	30 <sup>†</sup>	60	60	60	50	0
	65	60 <sup>†</sup>	70	70	60	50	10
	25	60	50	0	0	0	0
	*Machine shuts off after 20 seconds <sup>†</sup> Machine runs at reduced output volume after 15 seconds						
Froggy's Fog Amusement Park Fluid	100	5	90	90	90	90	90
	100	15	90	90	90	90	90
	100	30*	90	90	90	90	90
	65	30 <sup>†</sup>	60	60	60	50	0
	65	60 <sup>†</sup>	70	70	60	50	10
	25	60	50	0	0	0	0
	*Machine shuts off after 20 seconds <sup>†</sup> Machine runs at reduced output volume after 15 seconds						
Froggy's Fog Bog Fog	100	5	90	90	50	30	0
	100	15	90	90	60	60	60
	100	30	100	100	60	60	60
	65	30	100	30	0	0	0
	65	60	110	40	0	0	0
	25	60	110	0	0	0	0
Froggy's Fog Velocity	100	5	20	20	0	0	0
	100	15	20	20	20	10	0
	100	30*	20	20	20	10	0
	65	15	10	10	0	0	0
	65	30	0	10	0	0	0
	65	60	20	20	0	0	0
	25	60	20	0	0	0	0
*Machine shuts off after 20 seconds							
Froggy's Fog Cryo Freeze Fluid	100	5	20	20	0	0	0
	100	15	20	20	20	10	0
	100	30*	20	20	20	10	0
	65	15	10	10	0	0	0
	65	30	0	10	0	0	0
	65	60	20	20	0	0	0
	25	60	20	0	0	0	0
*Machine shuts off after 20 seconds							

**ANTARI**

TIME-AND-DISTANCE GUIDELINES							
M-5							
Fluid	Machine Setting	Release Duration (sec)	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
Froggy's Fog Quick Blast Fluid	100	5	20	20	0	0	0
	100	15	20	20	20	10	0
	100	30*	20	20	20	10	0
	65	15	10	10	0	0	0
	65	30	0	10	0	0	0
	65	60	20	20	0	0	0
	25	60	20	0	0	0	0
	*Machine shuts off after 20 seconds						
Reference: <a href="#">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, Velocity/Cryo Freeze/Quick Blast/Training Smoke Q, Techno Fog/Beam Splitter, Neutronic Haze, DaFiddy, Swamp Juice 2009 Formula, Light Fog</a> , prepared by ENVIRON International Corporation for Froggy's Fog, November 2014.							

**ANTARI**

TIME-AND-DISTANCE GUIDELINES							
M-8							
Fluid	Machine Setting	Release Duration (sec)	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
Antari FLG Fog Fluid	High	5	50	50	50	50	0
	High	15	50	50	50	50	0
	High	30	60	60	50	50	20
	Medium	30	50	50	50	30	0
	Medium	60*	60	60	50	30	0
	Low	60	50	50	50	30	0
	Low	120**	50	50	50	40	0
*Machine started warming up after 30 seconds **Machine shut off after 60 seconds							
Froggy's Fog Backwood Bay Fluid	High	5	80	80	80	80	70
	High	15	80	80	80	80	70
	High	30	80	80	80	80	70
	Medium	30	50	50	50	50	40
	Medium	60	60	60	60	60	50
	Medium	120*	70	70	60	60	50
	Low	60 <sup>†</sup>	60	60	60	60	50
Low	120 <sup>†</sup>	70	70	60	60	50	
*Machine shuts off after 52 seconds <sup>†</sup> Machine pulses every 5 seconds at low setting							
Froggy's Fog Amusement Park Fluid	High	5	80	80	80	80	70
	High	15	80	80	80	80	70
	High	30	80	80	80	80	70
	Medium	30	50	50	50	50	40
	Medium	60	60	60	60	60	50
	Medium	120*	70	70	60	60	50
	Low	60 <sup>†</sup>	60	60	60	60	50
Low	120 <sup>†</sup>	70	70	60	60	50	
*Machine shuts off after 52 seconds <sup>†</sup> Machine pulses every 5 seconds at low setting							
Froggy's Fog Bog Fog Fluid	High	5	40	40	30	20	0
	High	15	70	70	60	60	60
	High	30	70	70	60	60	60
	Medium	15	60	60	60	60	60
	Medium	30	60	60	60	60	60
	Medium	60*	110	110	60	60	60
	Low	60	110	110	10	0	0
Low	120 <sup>†</sup>	110	110	10	0	0	
*Machine shuts off after 40 seconds <sup>†</sup> Machine shuts off after 90 seconds							

**ANTARI**

TIME-AND-DISTANCE GUIDELINES							
M-8							
Fluid	Machine Setting	Release Duration (sec)	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
Froggy's Fog Velocity Fluid	High	5	30	30	30	30	0
	High	15	40	40	30	30	30
	High	30*	40	40	30	30	30
	Med	15	30	30	30	30	0
	Med	30†	30	30	30	30	10
	Med	60‡	30	30	30	30	10
	Low	60	30	30	0	0	0
	Low	120	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							
Froggy's Fog Cryo Freeze Fluid	High	5	30	30	30	30	0
	High	15	40	40	30	30	30
	High	30*	40	40	30	30	30
	Med	15	30	30	30	30	0
	Med	30†	30	30	30	30	10
	Med	60‡	30	30	30	30	10
	Low	60	30	30	0	0	0
	Low	120	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							
Froggy's Fog Quick Blast Fluid	High	5	30	30	30	30	0
	High	15	40	40	30	30	30
	High	30*	40	40	30	30	30
	Med	15	30	30	30	30	0
	Med	30†	30	30	30	30	10
	Med	60‡	30	30	30	30	10
	Low	60	30	30	0	0	0
	Low	120	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							
References: <a href="#">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, Velocity/Cryo Freeze/Quick Blast/Training Smoke O, Techno Fog/Beam Splitter, Neutronic Haze, DaFiddy, Swamp Juice 2009 Formula, Light Fog</a> , prepared by ENVIRON International Corporation for Froggy's Fog, November 2014.							
<a href="#">Environmental Testing of Theatrical Fog Equipment: Antari F-1 Fazer, F-4 Fazer, F-7 Smaze, X-380 Fazer, M-8, W-515D, W-715x Fog Jet, and DNG-200 Low Fog</a> , prepared by Ramboll Environ, December 2017.							

**ANTARI**

TIME-AND-DISTANCE GUIDELINES							
M-10							
Fluid	Machine Setting	Release Duration (sec)	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
Froggy's Fog Bog Fog Fluid	100%	5	90	90	90	70	70
	100%	15	100	100	90	70	70
	100%	30	120	120	100	100	70
	65%	15	90	60	50	40	30
	65%	30	120	120	70	70	60
	65%	60*	120	120	70	70	60
	25%	60	60	0	0	0	0
	25%	120	60	30	0	0	0
*Machine shuts off after 48 seconds							
Froggy's Fog Velocity Fluid	100%	5	30	30	30	30	20
	100%	15	30	30	30	30	20
	100%	30	30	30	30	30	20
	65%	15	30	20	20	0	0
	65%	30	30	30	30	0	0
	65%	60	30	30	30	0	0
	25%	60	0	0	0	0	0
	25%	120	0	0	0	0	0
Froggy's Fog Cryo Freeze Fluid	100%	5	30	30	30	30	20
	100%	15	30	30	30	30	20
	100%	30	30	30	30	30	20
	65%	15	30	20	20	0	0
	65%	30	30	30	30	0	0
	65%	60	30	30	30	0	0
	25%	60	0	0	0	0	0
	25%	120	0	0	0	0	0
Froggy's Fog Quick Blast Fluid	100%	5	30	30	30	30	20
	100%	15	30	30	30	30	20
	100%	30	30	30	30	30	20
	65%	15	30	20	20	0	0
	65%	30	30	30	30	0	0
	65%	60	30	30	30	0	0
	25%	60	0	0	0	0	0
	25%	120	0	0	0	0	0

Reference: 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, Velocity/Cryo Freeze/Quick Blast/Training Smoke Q, Techno Fog/Beam Splitter, Neutronic Haze, DaFiddy, Swamp Juice 2009 Formula, Light Fog, prepared by ENVIRON International Corporation for Froggy's Fog, October 2014.

**ANTARI**

TIME AND DISTANCE GUIDELINES Antari W-515D with Antari FLG Fog Fluid						
Release Duration	Time (in sec) After Which Air Concentrations Are Below Guidance Level (40 mg/m <sup>3</sup> )					
(secs)	Machine Setting	5 ft	10 ft	15 ft	20 ft	25 ft
5	100%	40	40	40	40	0
15	100%	50	50	50	50	30
30	100%	50	50	50	50	30
30	65%	50	50	20	0	0
60	65%	50	50	20	0	0
60	25%	0	0	0	0	0
120	25%	0	0	0	0	0

Reference: Environmental Testing of Theatrical Fog Equipment: Antari F-1 Fazer, F-4 Fazer, F-7 Smaze, X-380 Fazer, M-8, W-515D, W-715x Fog Jet, and DNG-200 Low Fog, prepared by Ramboll Environ, December 2017.

**ANTARI**

TIME AND DISTANCE GUIDELINES Antari W-715x Fog Jet with Antari FLC Fog Fluid						
Release Duration	Time (in sec) After Which Air Concentrations Are Below Guidance Level (40 mg/m <sup>3</sup> )					
(sec)	Machine Setting	5 ft	10 ft	15 ft	20 ft	25 ft
15	99%	80	80	80	40	10
15	75%	80	80	80	40	0
15	50%	70	0	0	0	0

Reference: Environmental Testing of Theatrical Fog Equipment: Antari F-1 Fazer, F-4 Fazer, F-7 Smaze, X-380 Fazer, M-8, W-515D, W-715x Fog Jet, and DNG-200 Low Fog, prepared by Ramboll Environ, December 2017.

**ANTARI**

TIME-AND-DISTANCE GUIDELINES							
X-515							
Fluid	Machine Setting	Release Duration (sec)	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
Froggy's Fog Backwood Bay Fluid	100%	5	40	40	40	40	0
	100%	15	70	70	70	50	40
	100%	30	70	70	70	50	40
	65%	30	50	40	40	40	0
	65%	60	70	70	40	40	0
	65%	120*	70	70	40	40	0
	25%	60	60	50	30	0	0
	25%	120	60	50	30	0	0
*Machine ran at reduced output volume after 45 seconds, machine turned off for 37 seconds during run							
Froggy's Fog Amusement Park Fluid	100%	5	40	40	40	40	0
	100%	15	70	70	70	50	40
	100%	30	70	70	70	50	40
	65%	30	50	40	40	40	0
	65%	60	70	70	40	40	0
	65%	120*	70	70	40	40	0
	25%	60	60	50	30	0	0
	25%	120	60	50	30	0	0
*Machine ran at reduced output volume after 45 seconds, machine turned off for 37 seconds during run							
Froggy's Fog Bog Fog Fluid	100%	5	40	30	0	0	0
	100%	15	50	30	0	0	0
	100%	30	80	80	70	30	0
	65%	30	80	60	50	0	0
	65%	60*	80	60	50	30	10
	65%	120*	80	60	50	30	10
	25%	60	80	40	0	0	0
	25%	120†	80	40	0	0	0
*Machine runs at reduced output volume after 25 seconds †Machine runs at reduced output volume after 4 seconds							
Froggy's Fog Velocity Fluid	100%	5	0	0	0	0	0
	100%	15	20	0	0	0	0
	100%	30*	20	20	0	0	0
	65%	30	20	10	0	0	0
	65%	60	20	10	0	0	0
	65%	120	20	10	0	0	0
	25%	60	0	0	0	0	0
	25%	120	0	0	0	0	0
*Machine ran at reduced output volume after 20 seconds							
Froggy's Fog Cryo Freeze Fluid	100%	5	0	0	0	0	0
	100%	15	20	0	0	0	0
	100%	30*	20	20	0	0	0



**ANTARI**

TIME-AND-DISTANCE GUIDELINES X-515							
Fluid	Machine Setting	Release Duration (sec)	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
	65%	30	20	10	0	0	0
	65%	60	20	10	0	0	0
	65%	120	20	10	0	0	0
	25%	60	0	0	0	0	0
	25%	120	0	0	0	0	0
	*Machine ran at reduced output volume after 20 seconds						
Froggy's Fog Quick Blast Fluid	100%	5	0	0	0	0	0
	100%	15	20	0	0	0	0
	100%	30*	20	20	0	0	0
	65%	30	20	10	0	0	0
	65%	60	20	10	0	0	0
	65%	120	20	10	0	0	0
	25%	60	0	0	0	0	0
	25%	120	0	0	0	0	0
	*Machine ran at reduced output volume after 20 seconds						
Reference: <a href="#">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, Velocity/Cryo Freeze/Quick Blast/Training Smoke Q, Techno Fog/Beam Splitter, Neutronic Haze, DaFiddy, Swamp Juice 2009 Formula, Light Fog</a> , prepared by ENVIRON International Corporation for Froggy's Fog, October 2014.							

**ANTARI**

TIME AND DISTANCE GUIDELINES Z-350 with Froggy's Fog Beam Splitter Fluid							
Release Duration (secs)	Time (in sec) After Which Air Concentrations Are Below Guidance Level (40 mg/m <sup>3</sup> )						
	Machine Setting		2 ft	5 ft	10 ft	15 ft	20 ft
30	Fan Max	Max	10	0	0	0	0
60	Fan Max	Max	10	0	0	0	0
120	Fan Max	Max	20	0	0	0	0
30	Fan Max	Middle	0	0	0	0	0
60	Fan Max	Middle	10	0	0	0	0
120	Fan Max	Middle	10	0	0	0	0
30	Fan Middle	Max	20	0	0	0	0
60	Fan Middle	Max	20	0	0	0	0
120	Fan Middle	Max	20	0	0	0	0
30	Fan Middle	Middle	0	0	0	0	0
60	Fan Middle	Middle	10	0	0	0	0
120	Fan Middle	Middle	10	0	0	0	0
30	Fan Min	Max	20	0	0	0	0
60	Fan Min	Max	20	0	0	0	0
120	Fan Min	Max	20	0	0	0	0
30	Fan Min	Middle	20	0	0	0	0
60	Fan Min	Middle	20	0	0	0	0
120	Fan Min	Middle	20	0	0	0	0

\*No output at minimum setting

Reference: [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, Velocity/Cryo Freeze/Quick Blast/Training Smoke Q, Techno Fog/Beam Splitter, Neutronic Haze, DaFiddy, Swamp Juice 2009 Formula, Light Fog](#), prepared by ENVIRON International Corporation for Froggy's Fog, October 2014.

**ANTARI**

TIME AND DISTANCE GUIDELINES							
Antari Z-380 Fazer with Antari FLG Fog 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	20	20	20	0	0
60	Max	Max	20	20	20	0	0
120	Max	Max	20	20	20	0	0
30	Max	Middle	0	0	0	0	0
60	Max	Middle	0	0	0	0	0
120	Max	Middle	0	0	0	0	0
30	Middle	Max	0	0	0	0	0
60	Middle	Max	0	0	0	0	0
120	Middle	Max	0	0	0	0	0
30	Middle	Middle	0	0	0	0	0
60	Middle	Middle	0	0	0	0	0
120	Middle	Middle	0	0	0	0	0

Reference: Environmental Testing of Theatrical Fog Equipment: Antari F-1 Fazer, F-4 Fazer, F-7 Smaze, X-380 Fazer, M-8, W-515D, W-715x Fog Jet, and DNG-200 Low Fog, prepared by Ramboll Environ, December 2017.

**BLUE HAZE ENTERTAINMENT (BHE)**

TIME-AND-DISTANCE GUIDELINES BHE 1550							
Fluid	Machine Setting	Release Duration (sec)	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
Froggy's Fog Backwood Bay Fluid	100%	5	40	40	40	40	0
	100%	15	70	70	70	50	40
	100%	30	70	70	70	50	40
	65%	30	50	40	40	40	0
	65%	60	70	70	40	40	0
	65%	120*	70	70	40	40	0
	25%	60	60	50	30	0	0
	25%	120	60	50	30	0	0
*Machine ran at reduced output volume after 45 seconds, machine turned off for 37 seconds during run							
Froggy's Fog Amusement Park Fluid	100%	5	40	40	40	40	0
	100%	15	70	70	70	50	40
	100%	30	70	70	70	50	40
	65%	30	50	40	40	40	0
	65%	60	70	70	40	40	0
	65%	120*	70	70	40	40	0
	25%	60	60	50	30	0	0
	25%	120	60	50	30	0	0
*Machine ran at reduced output volume after 45 seconds, machine turned off for 37 seconds during run							
Froggy's Fog Bog Fog Fluid	100%	5	40	30	0	0	0
	100%	15	50	30	0	0	0
	100%	30	80	80	70	30	0
	65%	30	80	60	50	0	0
	65%	60*	80	60	50	30	10
	65%	120*	80	60	50	30	10
	25%	60	80	40	0	0	0
	25%	120†	80	40	0	0	0
*Machine runs at reduced output volume after 25 seconds †Machine runs at reduced output volume after 4 seconds							
Froggy's Fog Velocity Fluid	100%	5	0	0	0	0	0
	100%	15	20	0	0	0	0
	100%	30*	20	20	0	0	0
	65%	30	20	10	0	0	0
	65%	60	20	10	0	0	0
	65%	120	20	10	0	0	0
	25%	60	0	0	0	0	0
	25%	120	0	0	0	0	0
*Machine ran at reduced output volume after 20 seconds							
	100%	5	0	0	0	0	0
	100%	15	20	0	0	0	0

**BLUE HAZE ENTERTAINMENT (BHE)**

TIME-AND-DISTANCE GUIDELINES BHE 1550							
Fluid	Machine Setting	Release Duration (sec)	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
Froggy's Fog Cryo Freeze Fluid	100%	30*	20	20	0	0	0
	65%	30	20	10	0	0	0
	65%	60	20	10	0	0	0
	65%	120	20	10	0	0	0
	25%	60	0	0	0	0	0
	25%	120	0	0	0	0	0
	*Machine ran at reduced output volume after 20 seconds						
Froggy's Fog Quick Blast Fluid	100%	5	0	0	0	0	0
	100%	15	20	0	0	0	0
	100%	30*	20	20	0	0	0
	65%	30	20	10	0	0	0
	65%	60	20	10	0	0	0
	65%	120	20	10	0	0	0
	25%	60	0	0	0	0	0
	25%	120	0	0	0	0	0
*Machine ran at reduced output volume after 20 seconds							
Reference: <u>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, Velocity/Cryo Freeze/Quick Blast/Training Smoke Q, Techno Fog/Beam Splitter, Neutronic Haze, DaFiddy, Swamp Juice 2009 Formula, Light Fog</u> , prepared by ENVIRON International Corporation for Froggy's Fog, October 2014.							

**CHAUVET**

TIME-AND-DISTANCE GUIDELINES							
1800 Flex							
Fluid	Machine Setting	Release Duration (sec)	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
Froggy's Fog Backwood Bay Fluid	Full	5	40	40	30	30	30
	Full	15	40	40	40	40	40
	Full	30*	60	60	50	50	40
	Full	60*	60	60	50	50	40
	Full	120*	60	60	50	50	50
	*Machine ran at reduced output volume after 18 seconds						
Froggy's Fog Amusement Park Fluid	Full	5	40	40	30	30	30
	Full	15	40	40	40	40	40
	Full	30*	60	60	50	50	40
	Full	60*	60	60	50	50	40
	Full	120*	60	60	50	50	50
	*Machine ran at reduced output volume after 18 seconds						
Froggy's Fog Bog Fog Fluid	Full	5	70	50	40	30	0
	Full	15	70	70	70	70	70
	Full	30*	90	90	70	70	70
	Full	60*	90	90	70	70	70
	Full	120*	90	90	70	70	70
	*Machine ran at reduced output volume after 20 seconds						
Froggy's Fog Velocity Fluid	Full	5	30	30	30	0	0
	Full	15*	30	30	30	20	0
	Full	30*	30	30	30	20	0
	Full	60*	30	30	30	20	0
	Full	120*	30	30	30	20	0
	*Machine ran at reduced output volume after 10 seconds						
Froggy's Fog Cryo Freeze Fluid	Full	5	30	30	30	0	0
	Full	15*	30	30	30	20	0
	Full	30*	30	30	30	20	0
	Full	60*	30	30	30	20	0
	Full	120*	30	30	30	20	0
	*Machine ran at reduced output volume after 10 seconds						
Froggy's Fog Quick Blast Fluid	Full	5	30	30	30	0	0
	Full	15*	30	30	30	20	0
	Full	30*	30	30	30	20	0
	Full	60*	30	30	30	20	0
	Full	120*	30	30	30	20	0
	*Machine ran at reduced output volume after 10 seconds						
Froggy's Fog Techno Fluid			<b>7 ft</b>	<b>15 ft</b>	<b>20 ft</b>	<b>25 ft</b>	<b>30 ft</b>
	Full	5	30	30	20	20	0
	Full	15*	30	30	30	20	20
	Full	30*	50	50	40	40	40
	Full	60*	50	50	40	40	40

**CHAUVET**

TIME-AND-DISTANCE GUIDELINES 1800 Flex							
Fluid	Machine Setting	Release Duration (sec)	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
	Full	120*	60	60	60	60	40
*Machine ran at reduced output volume after 12 seconds							
Reference: <a href="#">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, Velocity/Cryo Freeze/Quick Blast/Training Smoke Q, Techno Fog/Beam Splitter, Neutronic Haze, DaFiddy, Swamp Juice 2009 Formula, Light Fog</a> , prepared by ENVIRON International Corporation for Froggy's Fog, October 2014.							

**CHAUVET**

TIME-AND-DISTANCE GUIDELINES Amhaze ECO with Premium Haze Fluid (PHF)							
Release Duration (secs)	Output Setting (%)	Fan Setting (%)	Time (in sec) After Which Air Concentrations Are Below Guidance Level (40mg/m <sup>3</sup> )				
			5 ft	10 ft	15 ft	20 ft	25 ft
60	100	100	50	50	50	50	0
300	100	100	50	50	50	50	0
60	100	50	40	30	30	0	0
300	100	50	50	50	30	0	0

Reference: Environmental Testing of Theatrical Fog Equipment: Chauvet AmHaze ECO, prepared by Ramboll for Chauvet Professional, October 2019.

TIME AND DISTANCE GUIDELINES AmHaze II with Froggy's Fog Faze Haze Fluid						
Release Duration (secs)	Time (in sec) After Which Air Concentrations Are Below Guidance Level (40 mg/m <sup>3</sup> )					
	Machine Setting		4 ft	8 ft	12 ft	16 ft
30	Fan 100	100%	20	0	0	0
60	Fan 100	100%	20	0	0	0
120	Fan 100	100%	20	30	0	0
30	Fan 100	65%	20	0	0	0
60	Fan 100	65%	20	0	0	0
120	Fan 100	65%	20	0	0	0
30	Fan 100	25%	0	0	0	0
60	Fan 100	25%	10	0	0	0
120	Fan 100	25%	10	0	0	0
30	Fan 50	100%	30	30	0	0
60	Fan 50	100%	40	40	0	0
120	Fan 50	100%	40	40	30	0
30	Fan 50	65%	30	30	0	0
60	Fan 50	65%	30	30	0	0
120	Fan 50	65%	30	30	0	0
30	Fan 1	100%	50	50	40	0
60	Fan 1	100%	50	50	40	0
120	Fan 1	100%	50	50	40	0
30	Fan 1	65%	50	50	40	0
60	Fan 1	65%	50	50	40	0
120	Fan 1	65%	50	50	40	0

Reference: 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, Velocity/Cryo Freeze/Quick Blast/Training Smoke Q, Techno Fog/Beam Splitter, Neutronic Haze, DaFiddy, Swamp Juice 2009 Formula, Light Fog, prepared by ENVIRON International Corporation for Froggy's Fog, October 2014.



**CHAUVET**

TIME-AND-DISTANCE GUIDELINES Chauvet Amhaze Stadium with Premium Haze Fluid							
Release Duration (secs)	Fan Setting (%)	Haze Setting (%)	Time (in sec) After Which Air Concentrations Are Below Guidance Level (40mg/m <sup>3</sup> )				
			Distance from Machine				
			5 ft	10 ft	15 ft	20 ft	25 ft
300	100	10	0	0	0	0	0
300	100	100	20	20	20	20	20
300	100	50	10	10	10	10	10

Reference: Environmental Testing of Theatrical Fog Equipment: Amhaze Stadium Hazer and Cloud 9 Fogger, prepared by Ramboll for Chauvet Professional, August 2020.

TIME-AND-DISTANCE GUIDELINES Chauvet Cloud 9 with LLG Fog Fluid							
Release Duration (secs)	Fan Setting (%)	Fog Setting (%)	Time (in sec) After Which Air Concentrations Are Below Guidance Level (40mg/m <sup>3</sup> )				
			Height Above Ground				
			4 in	12 in	20 in	32 in	40 in
30	100	100	70	70	0	0	0
60	100	100	270	270	130	0	0
30	100	75	180	180	50	20	0
60	100	75	200	200	140	20	0
30	100	50	130	130	130	0	0
60	100	50	130	130	130	110	0

Reference: Environmental Testing of Theatrical Fog Equipment: Amhaze Stadium Hazer and Cloud 9 Fogger, prepared by Ramboll for Chauvet Professional, August 2020.

**CHAUVET**

<b>TIME-AND-DISTANCE GUIDELINES Geyser with Froggy's Fog Quick Blast 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	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

Reference: [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, Velocity/Cryo Freeze/Quick Blast/Training Smoke Q, Techno Fog/Beam Splitter, Neutronic Haze, DaFiddy, Swamp Juice 2009 Formula, Light Fog](#), prepared by ENVIRON International Corporation for Froggy's Fog, October 2014.

**CITC**

TIME AND DISTANCE GUIDELINES AquaMax with Organic Haze Fluid							
Release Duration (secs)	Time (in sec) After Which Air Concentrations Are Below Guidance Level (50 mg/m <sup>3</sup> )						
	Machine Setting		5 ft	10 ft	15 ft	20 ft	25 ft
5	Fan 3	75%	10	0	0	0	0
10	Fan 3	75%	10	0	0	0	0
30	Fan 3	75%	10	0	0	0	0
60	Fan 3	75%	10	0	0	0	0
120	Fan 3	75%	30	0	0	0	0
5	Fan 3	50%	0	0	0	0	0
10	Fan 3	50%	0	0	0	0	0
30	Fan 3	50%	0	0	0	0	0
60	Fan 3	50%	0	0	0	0	0
120	Fan 3	50%	0	0	0	0	0
5	Fan 3	25%	0	0	0	0	0
10	Fan 3	25%	0	0	0	0	0
30	Fan 3	25%	0	0	0	0	0
60	Fan 3	25%	0	0	0	0	0
120	Fan 3	25%	0	0	0	0	0
5	Fan 1	75%	0	0	0	0	0
10	Fan 1	75%	0	0	0	0	0
30	Fan 1	75%	0	0	0	0	0
60	Fan 1	75%	10	0	0	0	0
120	Fan 1	75%	25	0	0	0	0
5	Fan 1	50%	0	0	0	0	0
10	Fan 1	50%	10	0	0	0	0
30	Fan 1	50%	10	0	0	0	0
60	Fan 1	50%	10	0	0	0	0
120	Fan 1	50%	10	0	0	0	0
5	Fan 1	25%	0	0	0	0	0
10	Fan 1	25%	0	0	0	0	0
30	Fan 1	25%	5	0	0	0	0
60	Fan 1	25%	5	0	0	0	0
120	Fan 1	25%	5	0	0	0	0

Reference: Calibration Factors and Time-And-Distance Guidelines for Use of Theatrical Fog Equipment: Aquamax with Organic Haze Fluid and HazeMax with Water Vapour Haze Fluid, prepared by ENVIRON International Corporation for CITC, August 2014.

**CITC**

<b>TIME-AND-DISTANCE GUIDELINES Fantasy FX Professional Haze</b>			
<b>Release Duration (secs)</b>	<b>Time (in sec) After Which Air Concentrations Are Below Guidance Level (25 mg/m<sup>3</sup>)</b>		
	<b>Release Height</b>	<b>2 ft</b>	<b>6 ft</b>
2	Breathing height	0	X
5		0	X
10		0	X
15		2	2
30		2	2

Note: X = not tested, but results are expected to be comparable to those at the 2 ft distance

Releasing the haze slightly above breathing height (e.g., simulating the spraying of hair spray above the head) did not result in any exceedances of the peak guidance level at the breathing height.

Reference: [Development of Time-And-Distance Guidelines for Use of Theatrical Smoke Equipment: Fantasy FX Professional Haze](#), prepared by ENVIRON International Corporation for Richard Frankel Productions, Inc., December 14, 2006.

<b>TIME-AND-DISTANCE GUIDELINES HazeMax with Water Vapor Haze Fluid</b>						
<b>Release Duration (secs)</b>	<b>Time (in sec) After Which Air Concentrations Are Below Guidance Level (50 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	75%	30	0	0	0	0
10	75%	30	10	0	0	0
30	75%	60	50	30	0	0
60	75%	60	50	30	0	0
120	75%	70	50	30	0	0
5	50%	20	0	0	0	0
10	50%	20	0	0	0	0
30	50%	60	50	0	0	0
60	50%	60	50	0	0	0
120	50%	70	50	0	0	0

Reference: [Calibration Factors and Time-And-Distance Guidelines for Use of Theatrical Fog Equipment: Aquamax with Organic Haze Fluid and HazeMax with Water Vapour Haze Fluid](#), prepared by ENVIRON International Corporation for CITC, August 2014.

**ELATION**

TIME-AND-DISTANCE GUIDELINES Elation Magma Prime with AEF Fog Fluid							
Release Duration (secs)	Fan Setting (%)	Fog Setting (%)	Time (in sec) After Which Air Concentrations Are Below Guidance Level (40mg/m <sup>3</sup> )				
			Distance from Machine				
			5 ft	10 ft	15 ft	20 ft	25 ft
300	100	100	0	0	0	0	0
300	100	75	0	0	0	0	0
300	75	100	0	0	0	0	0

Reference: [Environmental Testing of Theatrical Fog Equipment: Magma Prime Fogger](#), prepared by Ramboll for Elation Professional, August 2020.

**ETC/HIGH END SYSTEMS**

TIME-AND-DISTANCE GUIDELINES ETC/High End Systems F-100								
Fluid	Machine Setting	Release Duration (sec)	Time (in sec) After Which Air Concentrations Are Below Guidance Level (40 mg/m <sup>3</sup> )					
			3 ft	6 ft	9 ft	12 ft	15 ft	18 ft
Atmosphere Cold Flow Formula	Full	15	70	30	30	30	30	30
	Medium	15	40	40	30	30	0	0
Atmosphere HQ Formula	Full	15	190	190	180	20	0	0
	Medium	15	170	80	70	0	0	0
Atmosphere Stage Formula	Full/Med	15	0	0	0	0	0	0

Reference: Equipment-Based Guidelines for the Use of Theatrical Smoke and Haze, prepared by ENVIRON International Corporation for the Equity-League Pension and Health Trust Funds, June 8, 2001.

TIME-AND-DISTANCE GUIDELINES ETC/High End Systems FQ-100							
Fluid	Machine Setting	Release Duration (sec)	Time (in sec) After Which Air Concentrations Are Below Guidance Level (40 mg/m <sup>3</sup> )				
			6 ft	9 ft	12 ft	15 ft	18 ft
Atmosphere HQ Formula	75	5	60	60	60	60	60
	75	15	100	100	100	100	90
	50	5	60	60	60	60	60
	50	15	100	100	100	100	90
	25	5	60	60	60	60	60
	25	15	60	60	60	60	60
	25	30	80	80	80	80	80
Atmosphere Stage Formula	99	5	100	100	100	100	80
	99	15	100	100	100	100	80
	75	5	80	80	80	80	80
	75	15	90	90	90	90	80
	50	5	80	80	80	80	80
	50	15	90	90	90	90	80
	25	5	0	0	0	0	0
	25	15	90	90	90	90	80

Reference: Calibration Factors and Time-and-Distance Guidelines for the Use of Theatrical Fog Equipment, Barco FQ-100 with Atmospheres Stage Fluid and Barco FQ-100 with Atmospheres HQ Fluid, prepared by ENVIRON International Corporation for Barco Lighting Systems, December 2010.

**ETC/HIGH END SYSTEMS**

TIME-AND-DISTANCE GUIDELINES							
ETC/High End Systems HQ100 Hazer with HQ100 Haze Fluid							
Release Duration (secs)	Fan Setting (%)	Haze Setting (%)	Time (in sec) After Which Air Concentrations Are Below Guidance Level (40mg/m <sup>3</sup> )				
			Height Above Ground				
			5 ft	10 ft	15 ft	20 ft	25 ft
15	100	100	15	15	15	15	0
30	100	100	20	20	20	20	10
60	100	100	20	20	20	20	10
300	100	100	20	20	20	20	10
15	100	75	15	15	0	0	0
30	100	75	15	15	0	0	0
60	100	75	15	15	10	0	0
300	100	75	15	15	10	0	0
15	75	100	15	15	0	0	0
30	75	100	20	20	20	0	0
60	75	100	20	20	20	0	0
300	75	100	20	20	20	0	0

Reference: Environmental Testing of Theatrical Fog Equipment: HQ100 Hazer, prepared by Ramboll for High End Systems, August 2020.

**FIREBASE**

TIME-AND-DISTANCE GUIDELINES SG-1300							
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
Froggy's Fog Training Smoke FR Fluid – Fire Rescue Formula	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							
Froggy's Fog Training Smoke XD Fluid – Extreme Density	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
*Machine takes 6 seconds to release fog after button is pressed †Machine runs at significantly reduced output volume after 80 seconds							
Froggy's Fog Training Smoke Q Fluid – Quick Dissipating	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
References: 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, Velocity/Cryo Freeze/Quick Blast/Training Smoke Q, Techno Fog/Beam Splitter, Neutronic Haze, DaFiddy, Swamp Juice 2009 Formula, Light Fog, prepared by ENVIRON International Corporation for Froggy's Fog, October 2014.							



**FIREBASE**

TIME-AND-DISTANCE GUIDELINES SG-2600							
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
Froggy's Fog Training Smoke FR Fluid – Fire Rescue Formula	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							
Froggy's Fog Training Smoke XD Fluid – Extreme Density	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
References: <a href="#">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, Velocity/Cryo Freeze/Quick Blast/Training Smoke Q, Techno Fog/Beam Splitter, Neutronic Haze, DaFiddy, Swamp Juice 2009 Formula, Light Fog</a> , prepared by ENVIRON International Corporation for Froggy's Fog, October 2014.							

**FIREBASE**

TIME-AND-DISTANCE GUIDELINES FireBase SG M1500							
Fluid	Release Duration (sec)	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
Froggy's Fog Training Smoke FR Fire Rescue Formula	5	100	90	90	90	90	90
	15	100	90	90	90	90	90
	30*	100	90	90	90	90	90
	30 <sup>†</sup>	65	60	60	60	50	0
	60 <sup>†</sup>	65	70	70	60	50	10
	60	25	50	0	0	0	0
	*Machine shuts off after 20 seconds <sup>†</sup> Machine runs at reduced output volume after 15 seconds						
Froggy's Fog Training Smoke XD Extreme Density	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
Froggy's Fog Training Smoke Q Quick Dissipating	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	0	10	0	0	0
	60	65	20	20	0	0	0
	60	25	20	0	0	0	0
*Machine shuts off after 20 seconds							
Reference: <u>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, Velocity/Cryo Freeze/Quick Blast/Training Smoke Q, Techno Fog/Beam Splitter, Neutronic Haze, DaFiddy, Swamp Juice 2009 Formula, Light Fog</u> , prepared by ENVIRON International Corporation for Froggy's Fog, October 2014.							

**FIREBASE**

TIME-AND-DISTANCE GUIDELINES FireBase SG-M1800							
Fluid	Machine Setting	Release Duration (sec)	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
Froggy's Fog Training Smoke FR – Fire Rescue Formula	High	5	80	80	80	80	70
	High	15	80	80	80	80	70
	High	30	80	80	80	80	70
	Medium	30	50	50	50	50	40
	Medium	60	60	60	60	60	50
	Medium	120*	70	70	60	60	50
	Low	60†	60	60	60	60	50
	Low	120†	70	70	60	60	50
*Machine shuts off after 52 seconds †Machine pulses every 5 seconds at low setting							
Froggy's Fog Training Smoke XD – Extreme Density	High	5	40	40	30	20	0
	High	15	70	70	60	60	60
	High	30	70	70	60	60	60
	Medium	15	60	60	60	60	60
	Medium	30	60	60	60	60	60
	Medium	60*	110	110	60	60	60
	Low	60	110	110	10	0	0
	Low	120†	110	110	10	0	0
*Machine shuts off after 40 seconds †Machine shuts off after 90 seconds							
Froggy's Fog Training Smoke Q – Quick Dissipating	High	5	30	30	30	30	0
	High	15	40	40	30	30	30
	High	30*	40	40	30	30	30
	Med	15	30	30	30	30	0
	Med	30†	30	30	30	30	10
	Med	60‡	30	30	30	30	10
	Low	60	30	30	0	0	0
	Low	120	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							
References: 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, Velocity/Cryo Freeze/Quick Blast/Training Smoke Q, Techno Fog/Beam Splitter, Neutronic Haze, DaFiddy, Swamp Juice 2009 Formula, Light Fog, prepared by ENVIRON International Corporation for Froggy's Fog, October 2014.							

**FIREBASE**

TIME-AND-DISTANCE GUIDELINES FireBase SG-M3000							
Fluid	Machine Setting	Release Duration (sec)	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
Froggy's Fog Training Smoke XD – Extreme Density	100%	5	90	90	90	70	70
	100%	15	100	100	90	70	70
	100%	30	120	120	100	100	70
	65%	15	90	60	50	40	30
	65%	30	120	120	70	70	60
	65%	60*	120	120	70	70	60
	25%	60	60	0	0	0	0
	25%	120	60	30	0	0	0
*Machine shuts off after 48 seconds							
Froggy's Fog Training Smoke Q – Quick Dissipating	100%	5	30	30	30	30	20
	100%	15	30	30	30	30	20
	100%	30	30	30	30	30	20
	65%	15	30	20	20	0	0
	65%	30	30	30	30	0	0
	65%	60	30	30	30	0	0
	25%	60	0	0	0	0	0
	25%	120	0	0	0	0	0
References: <a href="#">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, Velocity/Cryo Freeze/Quick Blast/Training Smoke Q, Techno Fog/Beam Splitter, Neutronic Haze, DaFiddy, Swamp Juice 2009 Formula, Light Fog</a> , prepared by ENVIRON International Corporation for Froggy's Fog, October 2014.							

**FROGGY'S FOG**

TIME-AND-DISTANCE GUIDELINES							
Froggy's Fog Poseidon with Aqua Fog Fluid/Long Distance Formula							
Release Duration (secs)	Humidity Setting (%)	Fan Setting (%)	Fog Setting (%)	Time (in sec) After Which Air Concentrations Are Below Guidance Level (40mg/m <sup>3</sup> )			
				5 ft	10 ft	15 ft	25 ft
300	100	15	50	0	0	0	0
300	100	50	50	0	0	0	0
300	75	35	50	0	0	0	0
300	75	65	50	0	0	0	0
300	50	65	50	0	0	0	0

References: Environmental Testing of Theatrical Fog Equipment: Poseidon, prepared by Ramboll for Froggy's Fog, November 2019.

**HAZEBASE**

TIME-AND-DISTANCE GUIDELINES							
Base Classic							
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
Froggy's Fog Backwood Bay Fluid	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							
Froggy's Fog Amusement Park Fluid	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							
Froggy's Fog Bog Fog Fluid	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
Froggy's Fog Velocity Fluid	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
	60	25%	0	0	0	0	0

**HAZEBASE**

TIME-AND-DISTANCE GUIDELINES Base Classic							
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
	120	25%	0	0	0	0	0
Froggy's Fog CryoFreeze Fluid	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
Froggy's Fog Quick Blast Fluid	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
Ultratec Molecular Fog Fluid	5	99%	40	40	30	0	0
	15	99%	40	40	40	0	0
	30	99%	50	50	40	0	0
	15	75%	30	0	0	0	0
	30	75%	50	30	0	0	0
	60	75%	50	30	0	0	0
	60	50%	0	0	0	0	0
	120	50%	0	0	0	0	0
<p>References: <a href="#">Calibration Factors and Time-And-Distance Guidelines for Use of Theatrical Fog Equipment: Bog Fog/K-crazy Haze/Training Smoke XD, Backwood Bay/Faze Haze/Training Smoke FR, Velocity/Cryo Freeze/Quick Blast/Training Smoke Q, Techno Fog/Beam Splitter, Neutronic Haze, DaFiddy, Swamp Juice 2009 Formula, Light Fog</a>, prepared by ENVIRON International Corporation for Froggy's Fog, October 2014.</p> <p><a href="#">Environmental Testing of Theatrical Fog Equipment: Hazebase Base Classic with Ultratec Molecular Fog Fluid</a>, prepared by Ramboll Environ, October 2017</p>							

**HAZEBASE**

TIME-AND-DISTANCE GUIDELINES Base High Power 220V							
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
Froggy's Fog Backwood Bay Fluid	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							
Froggy's Fog Bog Fog Fluid	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
References: 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, Velocity/Cryo Freeze/Quick Blast/Training Smoke Q, Techno Fog/Beam Splitter, Neutronic Haze, DaFiddy, Swamp Juice 2009 Formula, Light Fog, prepared by ENVIRON International Corporation for Froggy's Fog, October 2014.							



**HAZEBASE**

TIME-AND-DISTANCE GUIDELINES								
Base Hazer Pro								
Fluid	Release Duration (secs)	Time (in sec) After Which Air Concentrations Are Below Guidance Level (40 mg/m <sup>3</sup> )						
		Machine Setting	4 ft	8 ft	12 ft	16 ft	20 ft	
Froggy's Fog Faze Haze Fluid	30	Fan 99	99	10	10	10	10	0
	60	Fan 99	99	10	10	10	10	0
	120	Fan 99	99	10	10	10	10	0
	30	Fan 99	65	0	0	0	0	0
	60	Fan 99	65	0	0	0	0	0
	120	Fan 99	65	0	0	0	0	0
	30	Fan 50	99	10	10	10	0	0
	60	Fan 50	99	10	10	10	0	0
	120	Fan 50	99	20	20	20	20	20
	30	Fan 50	65	10	10	10	0	0
	60	Fan 50	65	10	10	10	0	0
	120	Fan 50	65	10	10	10	0	0
	30	Fan 1	99	10	0	0	0	0
	60	Fan 1	99	20	0	0	0	0
	120	Fan 1	99	20	10	10	0	0
	30	Fan 1	65	10	0	0	0	0
	60	Fan 1	65	10	0	0	0	0
	120	Fan 1	65	10	10	10	0	0
base hazer liquid Fluid	30	Fan 99	99	10	0	0	0	0
	60	Fan 99	99	10	0	0	0	0
	120	Fan 99	99	10	0	0	0	0
	30	Fan 99	65	0	0	0	0	0
	60	Fan 99	65	0	0	0	0	0
	120	Fan 99	65	0	0	0	0	0
	30	Fan 50	99	10	0	0	0	0
	60	Fan 50	99	10	0	0	0	0
	120	Fan 50	99	10	0	0	0	0
	30	Fan 50	65	0	0	0	0	0
	60	Fan 50	65	10	0	0	0	0
	120	Fan 50	65	10	0	0	0	0
	30	Fan 1	99	20	0	0	0	0
	60	Fan 1	99	20	0	0	0	0
	120	Fan 1	99	20	0	0	0	0
	30	Fan 1	65	10	0	0	0	0
	60	Fan 1	65	10	0	0	0	0
	120	Fan 1	65	20	0	0	0	0

References: 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, Velocity/Cryo Freeze/Quick Blast/Training Smoke Q, Techno Fog/Beam Splitter, Neutronic Haze, DaFiddy, Swamp Juice 2009 Formula, Light Fog, prepared by ENVIRON International Corporation for Froggy's Fog, October 2014.

**LE MAITRE LTD.**

<b>TIME-AND-DISTANCE GUIDELINES</b>							
<b>Le Maitre Opti Mist Ranger with Mini Mist Canister</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>3 ft</b>	<b>6 ft</b>	<b>9 ft</b>	<b>12 ft</b>	<b>15 ft</b>	<b>18 ft</b>
15	Full	110	80	60	60	0	0
	Medium	110	80	60	60	0	0

Reference: [Equipment-Based Guidelines for the Use of Theatrical Smoke and Haze](#), prepared by ENVIRON International Corporation for the Equity-League Pension and Health Trust Funds, June 8, 2001.

<b>TIME AND DISTANCE GUIDELINES</b>							
<b>Le Maitre MVS with Froggy's Fog Neutronic Haze Fluid</b>							
<b>Release Duration (secs)</b>	<b>Time (in sec) After Which Air Concentrations Are Below Guidance Level (50 mg/m<sup>3</sup>)</b>						
	<b>Machine Setting</b>	<b>3 ft</b>	<b>5 ft</b>	<b>7 ft</b>	<b>10 ft</b>	<b>15 ft</b>	
5	Fan 15	15	20	10	0	0	0
10	Fan 15	15	20	10	10	10	0
30	Fan 15	15	20	10	10	10	10
60	Fan 15	10	20	10	0	0	0
120	Fan 15	10	20	10	10	10	0
5	Fan 15	10	20	10	10	10	10
10	Fan 15	5	0	0	0	0	0
30	Fan 15	5	10	10	10	0	0
60	Fan 15	5	10	10	10	0	0
120	Fan 7	15	20	20	20	0	0
5	Fan 7	15	20	20	20	20	20
10	Fan 7	15	20	20	20	20	20
30	Fan 7	10	20	10	0	0	0
60	Fan 7	10	20	10	10	10	10
120	Fan 7	10	20	10	10	10	10
5	Fan 1	15	0	0	0	0	0
10	Fan 1	15	20	20	20	20	0
30	Fan 1	15	20	20	20	20	0
60	Fan 1	10	0	0	0	0	0
120	Fan 1	10	20	20	20	20	0
5	Fan 1	10	20	20	20	20	0

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

Reference: [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, Velocity/Cryo Freeze/Quick Blast/Training Smoke O, Techno Fog/Beam Splitter, Neutronic Haze, DaFiddy, Swamp Juice 2009 Formula, Light Fog](#), prepared by ENVIRON International Corporation for Froggy's Fog, October 2014.

**LE MAITRE LTD.**

<b>TIME-AND-DISTANCE GUIDELINES</b>						
<b>Le Maitre Neutron XS with Froggy's Fog Neutronic Haze Fluid</b>						
<b>Release Duration (secs)</b>	<b>Time (in sec) After Which Air Concentrations Are Below Guidance Level (50 mg/m<sup>3</sup>)</b>					
	<b>Machine Setting</b>	<b>3 ft</b>	<b>6 ft</b>	<b>9 ft</b>	<b>12 ft</b>	<b>15 ft</b>
30	Full	0	0	0	0	0
60	Full	0	0	0	0	0
120	Full	0	0	0	0	0

Reference: 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, Velocity/Cryo Freeze/Quick Blast/Training Smoke Q, Techno Fog/Beam Splitter, Neutronic Haze, DaFiddy, Swamp Juice 2009 Formula, Light Fog, prepared by ENVIRON International Corporation for Froggy's Fog, October 2014.

**LOOK SOLUTIONS**

TIME-AND-DISTANCE GUIDELINES Look Solutions Cobra (1.8, 3.1) with Quick Fog Fluid							
Fluid	Release Duration (secs)	Output Setting (%)	Time (in sec) After Which Air Concentrations Are Below Guidance Level (40mg/m <sup>3</sup> )				
			5 ft	10 ft	15 ft	20 ft	25 ft
Quick Fog Fluid	15	70	35	35	35	35	0
	30	70	35	35	35	35	0
	60	70	35	35	35	35	0
	15	30	25	0	0	0	0
	30	30	25	10	10	10	10
	60	30	30	30	10	10	10
Regular Fog Fluid	15	70	65	65	35	35	0
	30	70	70	70	35	35	0
	60	70	70	70	40	35	0
	15	30	0	0	0	0	0
	30	30	80	50	0	0	0
	60	30	80	50	0	0	0
Slow Fog Fluid	15	70	85	85	85	85	0
	30	70	85	85	85	85	0
	60	70	130	130	130	85	10
	15	30	45	0	0	0	0
	30	30	50	50	20	0	0
	60	30	50	50	20	0	0

Reference: [Environmental Testing of Theatrical Fog Equipment: Cobra 1.8](#), prepared by Ramboll for Look Solutions USA, October 2019; Letter from Look Solutions to Ramboll, April 15, 2024.

TIME-AND-DISTANCE GUIDELINES Look Solutions Cobra (1.8, 3.1)/Cryo-Gate with Cryo Fog Fluid							
Release Duration (secs)	Output Setting (%)	CO <sub>2</sub> Setting	Time (in sec) After Which Air Concentrations Are Below Guidance Level (40mg/m <sup>3</sup> )				
			Height Above Ground				
			4 in	12 in	20 in	36 in	48 in
15	70	Low	115	0	0	0	0
30	70	Low	190	170	100	0	0
60	70	Low	200	200	200	130	50
15	70	Medium	195	125	125	0	0
30	70	Medium	195	170	170	0	0
60	70	Medium	280	190	190	0	0
15	30	Medium	65	15	15	0	0
30	30	Medium	65	15	15	0	0
60	30	Medium	65	15	15	0	0

Reference: [Environmental Testing of Theatrical Fog Equipment: Cobra 1.8](#), prepared by Ramboll for Look Solutions USA, October 2019; Letter from Look Solutions to Ramboll, April 15, 2024.

**LOOK SOLUTIONS**

<b>TIME-AND-DISTANCE GUIDELINES Look Solutions Cryo-Fog with Cryo-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>3 ft</b>	<b>9 ft</b>	<b>15ft</b>	<b>21 ft</b>	<b>27ft</b>	<b>33 ft</b>
30	99	0	0	0	0	0	0
60		0	0	0	0	0	0
180		0	0	0	0	0	0
300		0	0	0	0	0	0
30	75	0	0	0	0	0	0
60		0	0	0	0	0	0
180		0	0	0	0	0	0
300		0	0	0	0	0	0
30	30	0	0	0	0	0	0
60		0	0	0	0	0	0
180		0	0	0	0	0	0
300		0	0	0	0	0	0

References: [Development of Time-And-Distance Guidelines for Use of Theatrical Smoke Equipment: Look Solutions Low-Fogger](#), prepared by ENVIRON International Corporation for Look Solutions, August 2006.  
Letter from Look Solutions to ENVIRON International Corporation regarding Tiny-Compact, Tiny F07, Tiny C07, and Cryo-Fog, January 24, 2007

<b>TIME-AND-DISTANCE GUIDELINES Look Solutions Power Tiny Fogger with Tiny-Fluid</b>					
<b>Release Duration (sec)</b>	<b>Time (in sec) After Which Air Concentrations Are Below Guidance Level (40 mg/m<sup>3</sup>)</b>				
	<b>1 ft</b>	<b>3 ft</b>	<b>4 ft</b>	<b>6 ft</b>	<b>8 ft</b>
15	0	0	0	0	0
30	55	55	55	20	15
60	60	60	60	50	20

Reference: [Development of Time-And-Distance Guidelines for Use of Theatrical Smoke Equipment: Look Solutions Power Tiny](#), prepared by ENVIRON International Corporation for Look Solutions, August 2006.

**LOOK SOLUTIONS**

<b>TIME-AND-DISTANCE GUIDELINES Look Solutions Tiny-Fogger/Tiny F07 and Tiny-Compact/Tiny C07 with Tiny-Fluid</b>								
<b>Release Duration (sec)</b>	<b>Time (in sec) After Which Air Concentrations Are Below Guidance Level (40 mg/m<sup>3</sup>)</b>							
	<b>1 ft</b>	<b>2 ft</b>	<b>3 ft</b>	<b>4 ft</b>	<b>5 ft</b>	<b>6 ft</b>	<b>7 ft</b>	<b>8 ft</b>
5	33	33	10	0	0	0	0	0
15	33	33	23	7	0	0	0	0
30	57	57	57	57	20	20	20	0
60	67	67	57	57	20	20	20	0

Reference: Equipment-Based Guidelines for the Use of Theatrical Smoke and Haze, prepared by ENVIRON International Corporation for the Equity-League Pension and Health Trust Funds, June 8, 2001.

Letter from Look Solutions to ENVIRON International Corporation regarding Tiny-Compact, Tiny F07, Tiny C07, and Cryo-Fog, January 24, 2007

<b>TIME-AND-DISTANCE GUIDELINES Tiny FX with Tiny 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>1 ft</b>	<b>2 ft</b>	<b>3 ft</b>	<b>5 ft</b>	<b>7 ft</b>
5	NA	30	30	0	0	0
10	NA	50	40	0	0	0
20	NA	50	40	0	0	0
30	NA	50	40	30	20	0

Reference: Calibration Factors and Time-And-Distance Guidelines for Use of Theatrical Fog Equipment: Tiny FX with Tiny Fluid, Tiny S with Tiny Fluid, Viper NT with Slow-Fog Fluid, Viper NT with Regular-Fog Fluid, and Unique 2.1 with Unique Fluid, prepared by ENVIRON International Corporation for Look Solutions USA, Ltd., February 2014.

**LOOK SOLUTIONS**

<b>TIME-AND-DISTANCE GUIDELINES Tiny S with Tiny 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>1 ft</b>	<b>2 ft</b>	<b>3 ft</b>	<b>5 ft</b>	<b>7 ft</b>
5	High	0	0	0	0	0
10	High	30	30	30	0	0
20	High	30	30	30	0	0
30	High	30	30	30	0	0
45	High	30	30	30	0	0
5	Low	0	0	0	0	0
10	Low	0	0	0	0	0
20	Low	30	20	0	0	0
30	Low	30	20	0	0	0
45	Low	30	20	0	0	0

Reference: Calibration Factors and Time-And-Distance Guidelines for Use of Theatrical Fog Equipment: Tiny FX with Tiny Fluid, Tiny S with Tiny Fluid, Viper NT with Slow-Fog Fluid, Viper NT with Regular-Fog Fluid, and Unique 2.1 with Unique Fluid, prepared by ENVIRON International Corporation for Look Solutions USA, Ltd., February 2014.

<b>TIME-AND-DISTANCE GUIDELINES Unique 2.1 with Unique 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	90%	30	0	0	0	0
15	90%	30	0	0	0	0
30	90%	30	0	0	0	0
60	90%	30	0	0	0	0
120	90%	30	0	0	0	0
5	75%	0	0	0	0	0
15	75%	30	0	0	0	0
30	75%	30	0	0	0	0
60	75%	30	0	0	0	0
120	75%	30	0	0	0	0
5	50%	0	0	0	0	0
15	50%	0	0	0	0	0
30	50%	0	0	0	0	0
60	50%	0	0	0	0	0
120	50%	0	0	0	0	0

Reference: Calibration Factors and Time-And-Distance Guidelines for Use of Theatrical Fog Equipment: Tiny FX with Tiny Fluid, Tiny S with Tiny Fluid, Viper NT with Slow-Fog Fluid, Viper NT with Regular-Fog Fluid, and Unique 2.1 with Unique Fluid, prepared by ENVIRON International Corporation for Look Solutions USA, Ltd., February 2014.

**LOOK SOLUTIONS**

TIME-AND-DISTANCE GUIDELINES Look Solutions Viper NT with Quick-Fog Fluid							
Release Duration (secs)	Time (in sec) After Which Air Concentrations Are Below Guidance Level (40 mg/m <sup>3</sup> )						
	Machine Setting	3 ft	6 ft	9 ft	12 ft	15 ft	18 ft
5	99	15	15	15	15	15	15
15		30	30	30	30	30	28
30		30	30	30	30	30	28
45		30	30	30	30	30	28
5	75	5	5	5	0	0	0
15		10	10	10	10	5	0
30		25	25	25	25	25	25
60		40	40	40	40	40	15
120		40	40	40	40	40	15
180		40	40	40	40	40	15
5	50	0	0	0	0	0	0
15		0	0	0	0	0	0
30		20	20	20	15	0	0
60		20	20	20	20	0	0
180		20	20	20	20	0	0
30	25	0	0	0	0	0	0
60		20	20	0	0	0	0
180		20	20	0	0	0	0

Reference: Development of Time-And-Distance Guidelines for Use of Theatrical Smoke Equipment: Look Solutions Viper NT, prepared by ENVIRON International Corporation for Look Solutions, August 2006.



LOOK SOLUTIONS

TIME-AND-DISTANCE GUIDELINES Viper NT with Regular-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	90%	30	0	0	0	0
15	90%	50	50	50	50	0
30	90%	50	50	50	50	30
45*	90%*	>300	>300	>300	>300	290
5	75%	0	0	0	0	0
15	75%	0	0	0	0	0
30	75%	0	0	0	0	0
60*	75%*	>300	>300	>300	>300	290
120*	75%*	>300	>300	>300	>300	>300
5	50%	0	0	0	0	0
15	50%	0	0	0	0	0
30	50%	0	0	0	0	0
60*	50%*	>120	>120	>120	>120	>120
120*	50%*	>200	>200	>200	>200	>200

Note: \*At this high machine setting and/or release duration, production-specific testing is recommended

Reference: Calibration Factors and Time-And-Distance Guidelines for Use of Theatrical Fog Equipment: Tiny FX with Tiny Fluid, Tiny S with Tiny Fluid, Viper NT with Slow-Fog Fluid, Viper NT with Regular-Fog Fluid, and Unique 2.1 with Unique Fluid, prepared by ENVIRON International Corporation for Look Solutions USA, Ltd., February 2014.

**LOOK SOLUTIONS**

<b>TIME-AND-DISTANCE GUIDELINES Viper NT with Slow-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>3 ft</b>	<b>9 ft</b>	<b>15 ft</b>	<b>21 ft</b>	<b>27 ft</b>
5	99%	80	80	80	80	80
15	99%	110	110	110	110	110
30	99%	110	110	110	110	110
5	75%	50	50	50	0	0
15	75%	50	50	0	0	0
30	75%	50	50	0	0	0
60	75%	50	50	0	0	0
120	75%	50	50	0	0	0
15	50%	0	0	0	0	0
30	50%	0	0	0	0	0
60	50%	0	0	0	0	0

Reference: Calibration Factors and Time-And-Distance Guidelines for Use of Theatrical Fog Equipment: Tiny FX with Tiny Fluid, Tiny S with Tiny Fluid, Viper NT with Slow-Fog Fluid, Viper NT with Regular-Fog Fluid, and Unique 2.1 with Unique Fluid, prepared by ENVIRON International Corporation for Look Solutions USA, Ltd., February 2014.

**MARTIN by HARMAN**

TIME AND DISTANCE GUIDELINES K-1 with Froggy's Fog K-razy Haze Fluid							
Release Duration (secs)	Time (in sec) After Which Air Concentrations Are Below Guidance Level (40 mg/m <sup>3</sup> )						
	Machine Setting		3 ft	5 ft	7 ft	10 ft	15 ft
30	Fan 100	100%	0	0	0	0	0
60	Fan 100	100%	0	0	0	0	0
120	Fan 100	100%	0	0	0	0	0
30	Fan 100	65%	0	0	0	0	0
60	Fan 100	65%	0	0	0	0	0
120	Fan 100	65%	0	0	0	0	0
30	Fan 100	25%	0	0	0	0	0
60	Fan 100	25%	0	0	0	0	0
120	Fan 100	25%	0	0	0	0	0
30	Fan 50	65%	0	0	0	0	0
60	Fan 50	65%	0	0	0	0	0
120	Fan 50	65%	0	0	0	0	0
30	Fan 50	25%	0	0	0	0	0
60	Fan 50	25%	0	0	0	0	0
120	Fan 50	25%	0	0	0	0	0
30	Fan 10	65%	0	0	0	0	0
60	Fan 10	65%	0	0	0	0	0
120	Fan 10	65%	0	0	0	0	0
30	Fan 10	25%	0	0	0	0	0
60	Fan 10	25%	0	0	0	0	0
120	Fan 10	25%	0	0	0	0	0

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

Reference: [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, Velocity/Cryo Freeze/Quick Blast/Training Smoke Q, Techno Fog/Beam Splitter, Neutronic Haze, DaFiddy, Swamp Juice 2009 Formula, Light Fog](#), prepared by ENVIRON International Corporation for Froggy's Fog, October 2014.

**MARTIN by HARMAN**

TIME-AND-DISTANCE GUIDELINES Magnum 2000							
Fluid	Release Duration (secs)	Machine Setting	Time (in sec) After Which Air Concentrations Are Below Guidance Level (40 mg/m <sup>3</sup> )				
			5-8 ft	10-12 ft	15-16 ft	20 ft	25 ft
Froggy's Fog Backwood Bay Fluid	5	Max	60	60	60	50	50
	15	Max	70	70	60	50	50
	30 <sup>†</sup>	Max	70	70	60	50	50
	30 <sup>‡</sup>	Mid	60	60	10	0	0
	60 <sup>‡</sup>	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.							
Froggy's Fog Bog Fog Fluid	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.							
Froggy's Fog Velocity Fluid	30	Max	20	20	20	0	0
	60 <sup>†</sup>	Max	20	20	20	10	10
	120 <sup>†</sup>	Max	30	30	30	10	10
	30 <sup>†</sup>	Mid	20	20	20	0	0
	60 <sup>†</sup>	Mid	20	20	20	0	0
	120 <sup>†</sup>	Mid	20	20	20	0	0
* No output at minimum setting. †Machine turned off after 20 seconds.							
Froggy's Fog Cryo Freeze Fluid	30	Max	20	20	20	0	0
	60 <sup>†</sup>	Max	20	20	20	10	10
	120 <sup>†</sup>	Max	30	30	30	10	10
	30 <sup>†</sup>	Mid	20	20	20	0	0
	60 <sup>†</sup>	Mid	20	20	20	0	0
	120 <sup>†</sup>	Mid	20	20	20	0	0
* No output at minimum setting. †Machine turned off after 20 seconds.							

**MARTIN by HARMAN**

TIME-AND-DISTANCE GUIDELINES Magnum 2000							
Fluid	Release Duration (secs)	Machine Setting	Time (in sec) After Which Air Concentrations Are Below Guidance Level (40 mg/m <sup>3</sup> )				
			5-8 ft	10-12 ft	15-16 ft	20 ft	25 ft
Froggy's Fog Quick Blast Fluid	30	Max	20	20	20	0	0
	60 <sup>†</sup>	Max	20	20	20	10	10
	120 <sup>†</sup>	Max	30	30	30	10	10
	30 <sup>†</sup>	Mid	20	20	20	0	0
	60 <sup>†</sup>	Mid	20	20	20	0	0
	120 <sup>†</sup>	Mid	20	20	20	0	0
	* No output at minimum setting. †Machine turned off after 20 seconds.						
Reference: 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, Velocity/Cryo Freeze/Quick Blast/Training Smoke Q, Techno Fog/Beam Splitter, Neutronic Haze, DaFiddy, Swamp Juice 2009 Formula, Light Fog, prepared by ENVIRON International Corporation for Froggy's Fog, October 2014.							

**MARTIN by HARMAN**

TIME-AND-DISTANCE GUIDELINES ZR-33							
Fluid	Release Duration (secs)	Machine Setting	Time (in sec) After Which Air Concentrations Are Below Guidance Level (40 mg/m <sup>3</sup> )				
			5-8 ft	10-12 ft	15-16 ft	20 ft	25 ft
Froggy's Fog Velocity Fluid	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 had reduced output volume after 30 seconds.							
Froggy's Fog Cryo Freeze Fluid	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 had reduced output volume after 30 seconds.							
Froggy's Fog Quick Blast Fluid	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 had reduced output volume after 30 seconds							
Reference: 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, Velocity/Cryo Freeze/Quick Blast/Training Smoke Q, Techno Fog/Beam Splitter, Neutronic Haze, DaFiddy, Swamp Juice 2009 Formula, Light Fog, prepared by ENVIRON International Corporation for Froggy's Fog, October 2014.							

**MARTIN by HARMAN**

TIME-AND-DISTANCE GUIDELINES ZR-44							
Fluid	Release Duration (secs)	Machine Setting	Time (in sec) After Which Air Concentrations Are Below Guidance Level (40 mg/m <sup>3</sup> )				
			5-8 ft	10-12 ft	15-16 ft	20 ft	25 ft
Froggy's Fog Backwood Bay Fluid	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.							
Froggy's Fog Bog Fog Fluid	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							
Froggy's Fog Velocity Fluid	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							
Froggy's Fog Cryo Freeze Fluid	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	60	50	30	0	0
*Machine had reduced output volume after 45 seconds †Machine output volume reduced gradually throughout run							
Froggy's Fog Quick Blast Fluid	30	10	20	10	10	0	0
	60*	10	20	10	10	0	0
	120*	10	20	10	10	0	0

**MARTIN by HARMAN**

TIME-AND-DISTANCE GUIDELINES ZR-44							
Fluid	Release Duration (secs)	Machine Setting	Time (in sec) After Which Air Concentrations Are Below Guidance Level (40 mg/m <sup>3</sup> )				
			5-8 ft	10-12 ft	15-16 ft	20 ft	25 ft
	30	7	20	10	10	0	0
	60	7	20	10	10	0	0
	120 <sup>†</sup>	7	20	10	10	0	0
	60	3	10	0	0	0	0
	120	3	60	50	30	0	0
*Machine had reduced output volume after 45 seconds							
†Machine output volume reduced gradually throughout run							
Reference: <u>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, Velocity/Cryo Freeze/Quick Blast/Training Smoke Q, Techno Fog/Beam Splitter, Neutronic Haze, DaFiddy, Swamp Juice 2009 Formula, Light Fog</u> , prepared by ENVIRON International Corporation for Froggy's Fog, October 2014.							



**MDG FOG GENERATORS**

<b>TIME-AND-DISTANCE GUIDELINES MDG Atmosphere APS / ATMe with Neutral Fluid</b>						
<b>Release Duration (sec)</b>	<b>Time (in sec) After Which Air Concentrations Are Below Guidance Level (25 mg/m<sup>3</sup>)</b>					
	<b>3 ft</b>	<b>6 ft</b>	<b>9 ft</b>	<b>12 ft</b>	<b>15 ft</b>	<b>18 ft</b>
40	190	190	120	0	0	0
<p>Note: The MDG Atmosphere can be used in a “cycle cuing” mode, alternating between 40 seconds on and 100 seconds off at distances of 12 feet or further from the release point. Multiple machines can be run simultaneously provided they are at least 12 feet apart.</p> <p>Reference: <a href="#">Equipment-Based Guidelines for the Use of Theatrical Smoke and Haze</a>, prepared by ENVIRON International Corporation for the Equity-League Pension and Health Trust Funds, June 8, 2001.</p> <p>Letter from Ramboll to Actors’ Equity Association regarding MDG ATMe, June 26, 2023.</p>						

<b>TIME-AND-DISTANCE GUIDELINES MDG MAX 3000 APS with Neutral Fluid</b>						
<b>Release Duration (sec)</b>	<b>Time (in sec) After Which Air Concentrations Are Below Guidance Level (25 mg/m<sup>3</sup>)</b>					
	<b>3 ft</b>	<b>6 ft</b>	<b>9 ft</b>	<b>12 ft</b>	<b>15 ft</b>	<b>18 ft</b>
40	100	100	100	100	100	0
<p>Reference: <a href="#">Equipment-Based Guidelines for the Use of Theatrical Smoke and Haze</a>, prepared by ENVIRON International Corporation for the Equity-League Pension and Health Trust Funds, June 8, 2001.</p>						

<b>TIME-AND-DISTANCE GUIDELINES MDG Mini Max with Dense Fluid</b>							
<b>Release Duration (sec)</b>	<b>Machine Setting</b>	<b>Time (in sec) After Which Air Concentrations Are Below Guidance Level (40 mg/m<sup>3</sup>)</b>					
		<b>3 ft</b>	<b>6 ft</b>	<b>9 ft</b>	<b>12 ft</b>	<b>15 ft</b>	<b>18 ft</b>
15	Full	150	80	50	0	0	0
	Medium	130	40	40	0	0	0
<p>Reference: <a href="#">Equipment-Based Guidelines for the Use of Theatrical Smoke and Haze</a>, prepared by ENVIRON International Corporation for the Equity-League Pension and Health Trust Funds, June 8, 2001.</p>							

**PRACTICAL MAGIC & INNOVATION (PMI)**

TIME-AND-DISTANCE GUIDELINES PMI SmokeGENIE with Cloud Fluid						
Release Duration (secs)	Wind Level	Smoke Level	Accessories*	Time (in sec) After Which Air Concentrations Are Below Guidance Level (40mg/m <sup>3</sup> )		
				2 ft	4 ft	6 ft
60 (cont.)	5	3	PNL, JT	0	0	0
30 (cont.)	5	3	PNL, JT	0	0	0
15 (cont.)	5	3	PNL, JT	0	0	0
60 (cont.)	5	1	PNL, JT	0	0	0
30 (cont.)	5	1	PNL, JT	0	0	0
15 (cont.)	5	1	PNL, JT	0	0	0
60 (cont.)	3	3	PNL, JT	0	0	0
30 (cont.)	3	3	PNL, JT	0	0	0
15 (cont.)	3	3	PNL, JT	0	0	0
60 (cont.)	3	1	PNL, JT	0	0	0
30 (cont.)	3	1	PNL, JT	0	0	0
15 (cont.)	3	1	PNL, JT	0	0	0
60 (burst)	5	5	PNL, JT	0	0	0
30 (burst)	5	5	PNL, JT	0	0	0
15 (burst)	5	5	PNL, JT	0	0	0
60 (burst)	3	5	PNL, JT	0	0	0
30 (burst)	3	5	PNL, JT	0	0	0
15 (burst)	3	5	PNL, JT	0	0	0
60 (cont.)	5	3	PNS, Haze 3	0	0	0
30 (cont.)	5	3	PNS, Haze 3	0	0	0
15 (cont.)	5	3	PNS, Haze 3	0	0	0
60 (cont.)	5	3	PNS, Haze 1	0	0	0
30 (cont.)	5	3	PNS, Haze 1	0	0	0
15 (cont.)	5	3	PNS, Haze 1	0	0	0

Abbreviations  
cont. = continuous  
JT = Jet Tip  
PNL = Precision Nozzle Long  
PNS = Precision Nozzle Short

Reference: [Environmental Testing of Theatrical Fog Equipment: SmokeGENIE with Cloud Fluid](#), prepared by Ramboll for Practical Magic & Innovations Co., Ltd., October 2022. (revised April 2024)

**PRACTICAL MAGIC & INNOVATION (PMI)**

<b>TIME-AND-DISTANCE GUIDELINES</b>				
<b>PMI SmokeNINJA with Cloud Fluid</b>				
<b>Release Duration (seconds)</b>	<b>Tip</b>	<b>Time (in sec) After Which Air Concentrations Are Below Guidance Level (40mg/m3)</b>		
		<b>2 ft</b>	<b>4 ft</b>	<b>6 ft</b>
15	Jet	0	0	0
30	Jet	0	0	0
60	Jet	0	0	0
15	Dry Ice	0	0	0
30	Dry Ice	0	0	0
60	Dry Ice	0	0	0

Reference: [Environmental Testing of Theatrical Fog Equipment: SmokeNINJA with Cloud Fluid](#), prepared by Ramboll for Practical Magic & Innovations Co., Ltd., April 2024.

**REEL EFX, INC.**

TIME-AND-DISTANCE GUIDELINES DF-50								
Fluid	Release Duration (sec)	Time (in sec) After Which Air Concentrations Are Below Guidance Level (25 mg/m <sup>3</sup> )						
		3 ft	5-6 ft	7 ft	9-10 ft	12 ft	15 ft	18 ft
Diffusion Fluid	40	0	0	-	0	0	0	0
Froggy's Fog DaFiddy Fluid – Oil Based Haze	5	10	0	0	0	-	0	-
	15	10	0	0	0	-	0	-
	30	10	10	0	0	-	0	-
	60	10	10	0	0	-	0	-
	120	10	10	0	0	-	0	-

Note: The DF-50 can be used in a “cycle cuing” mode, alternating between 40 seconds on and 100 seconds off at all distances from the release point.

References: [Equipment-Based Guidelines for the Use of Theatrical Smoke and Haze](#), prepared by ENVIRON International Corporation for the Equity-League Pension and Health Trust Funds, June 8, 2001. [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, Velocity/Cryo Freeze/Quick Blast/Training Smoke O, Techno Fog/Beam Splitter, Neutronic Haze, DaFiddy, Swamp Juice 2009 Formula, Light Fog](#), prepared by ENVIRON International Corporation for Froggy's Fog, October 2014.

**ROBE LIGHTING S.R.O**

TIME-AND-DISTANCE GUIDELINES							
Robe Fog 1550 FT							
Fluid	Machine Setting	Release Duration (sec)	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
Froggy's Fog Backwood Bay Fluid	100%	5	40	40	40	40	0
	100%	15	70	70	70	50	40
	100%	30	70	70	70	50	40
	65%	30	50	40	40	40	0
	65%	60	70	70	40	40	0
	65%	120*	70	70	40	40	0
	25%	60	60	50	30	0	0
	25%	120	60	50	30	0	0
	*Machine ran at reduced output volume after 45 seconds, machine turned off for 37 seconds during run						
Froggy's Fog Amusement Park Fluid	100%	5	40	40	40	40	0
	100%	15	70	70	70	50	40
	100%	30	70	70	70	50	40
	65%	30	50	40	40	40	0
	65%	60	70	70	40	40	0
	65%	120*	70	70	40	40	0
	25%	60	60	50	30	0	0
	25%	120	60	50	30	0	0
	*Machine ran at reduced output volume after 45 seconds, machine turned off for 37 seconds during run						
Froggy's Fog Bog Fog Fluid	100%	5	40	30	0	0	0
	100%	15	50	30	0	0	0
	100%	30	80	80	70	30	0
	65%	30	80	60	50	0	0
	65%	60*	80	60	50	30	10
	65%	120*	80	60	50	30	10
	25%	60	80	40	0	0	0
	25%	120†	80	40	0	0	0
	*Machine runs at reduced output volume after 25 seconds †Machine runs at reduced output volume after 4 seconds						
Froggy's Fog Velocity Fluid	100%	5	0	0	0	0	0
	100%	15	20	0	0	0	0
	100%	30*	20	20	0	0	0
	65%	30	20	10	0	0	0
	65%	60	20	10	0	0	0
	65%	120	20	10	0	0	0
	25%	60	0	0	0	0	0
	25%	120	0	0	0	0	0

**ROBE LIGHTING S.R.O**

TIME-AND-DISTANCE GUIDELINES							
Robe Fog 1550 FT							
Fluid	Machine Setting	Release Duration (sec)	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
*Machine ran at reduced output volume after 20 seconds							
Froggy's Fog Cryo Freeze Fluid	100%	5	0	0	0	0	0
	100%	15	20	0	0	0	0
	100%	30*	20	20	0	0	0
	65%	30	20	10	0	0	0
	65%	60	20	10	0	0	0
	65%	120	20	10	0	0	0
	25%	60	0	0	0	0	0
	25%	120	0	0	0	0	0
*Machine ran at reduced output volume after 20 seconds							
Froggy's Fog Quick Blast Fluid	100%	5	0	0	0	0	0
	100%	15	20	0	0	0	0
	100%	30*	20	20	0	0	0
	65%	30	20	10	0	0	0
	65%	60	20	10	0	0	0
	65%	120	20	10	0	0	0
	25%	60	0	0	0	0	0
	25%	120	0	0	0	0	0
*Machine ran at reduced output volume after 20 seconds							
Reference: 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, Velocity/Cryo Freeze/Quick Blast/Training Smoke Q, Techno Fog/Beam Splitter, Neutronic Haze, DaFiddy, Swamp Juice 2009 Formula, Light Fog, prepared by ENVIRON International Corporation for Froggy's Fog, October 2014.							

**ROSCO LABORATORIES**

<b>TIME-AND-DISTANCE GUIDELINES Rosco Model 1500/1600</b>								
<b>Fluid</b>	<b>Machine Setting</b>	<b>Release Duration (sec)</b>	<b>Time (in sec) After Which Air Concentrations Are Below Guidance Level (40 mg/m<sup>3</sup>)</b>					
			<b>3 ft</b>	<b>6 ft</b>	<b>9 ft</b>	<b>12 ft</b>	<b>15 ft</b>	<b>18 ft</b>
Rosco Clear Fog Fluid	Full	15	230	150	60	0	0	0
	Medium	15	230	70	60	0	0	0
Rosco Fog Fluid	Full	15	170	100	80	40	40	40
	Medium	15	170	100	80	40	40	40
Rosco Light Fog Fluid	Full	15	150	70	70	70	60	50
	Medium	15	150	50	50	50	50	50
Rosco Stage & Studio Fluid	Full	15	80	80	50	40	40	40
	Medium	15	80	80	40	30	30	30

Reference: Equipment-Based Guidelines for the Use of Theatrical Smoke and Haze, prepared by ENVIRON International Corporation for the Equity-League Pension and Health Trust Funds, June 8, 2001.

**ROSCO LABORATORIES**

TIME-AND-DISTANCE GUIDELINES Rosco Model 1750								
Fluid	Machine Setting	Release Duration (secs)	Time (in sec) After Which Air Concentrations Are Below Guidance Level ( 40 mg/m <sup>3</sup> )					
			3 ft	6 ft	9 ft	12 ft	15 ft	18 ft
Rosco Fog Fluid	100%	5	45	45	30	10	0	0
		15	45	45	45	45	35	20
		30	50	45	45	45	40	30
	60%	5	60	60	60	0	0	0
		15	60	60	60	50	10	0
		30	70	70	70	70	10	0
	30%	15	25	0	0	0	0	0
		30	30	30	0	0	0	0
		60	40	30	5	0	0	0
		180	40	30	5	0	0	0
Rosco Stage & Studio Fluid	100%	15	25	25	20	15	0	0
		30	25	25	25	20	20	0
		45	30	30	30	30	20	0
	60%	15	15	15	10	10	0	0
		30	20	20	20	12	0	0
		45	35	35	35	20	0	0
	30%	15	10	5	0	0	0	0
		30	10	5	0	0	0	0
		45	20	5	0	0	0	0

Reference: Development of Time-And-Distance Guidelines for Use of Theatrical Smoke Equipment: Rosco Model 1750, prepared by ENVIRON International Corporation for Rosco Laboratories, August 2006.



**ROSCO LABORATORIES**

TIME-AND-DISTANCE GUIDELINES Rosco Alpha 900								
Fluid	Machine Setting	Release Duration (sec)	Time (in sec) After Which Air Concentrations Are Below Guidance Level (40 mg/m <sup>3</sup> )					
			3 ft	6 ft	9 ft	12 ft	15 ft	18 ft
Rosco Fog Fluid	On	15	220	220	180	180	160	110
Rosco Stage & Studio Fluid	On	15	140	140	140	130	50	30

Reference: [Equipment-Based Guidelines for the Use of Theatrical Smoke and Haze](#), prepared by ENVIRON International Corporation for the Equity-League Pension and Health Trust Funds, June 8, 2001.

**ROSCO LABORATORIES**

TIME-AND-DISTANCE GUIDELINES Rosco Delta 3000 (100% and 50% Settings)								
Fluid	Machine Setting	Release Duration (sec)	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 ft
Rosco Clear Fog Fluid	100%	30	215	215	215	215	215	115
	50%	30	88	88	88	88	88	70
Rosco Fog Fluid	100%	30	157	157	157	87	87	87
	50%	30	94	94	94	57	56	44
Rosco Light Fog Fluid	100%	30	63	63	63	53	53	53
	50%	30	60	10	0	0	0	0
Rosco Stage & Studio Fluid	100%	30	53	53	53	53	53	53
	50%	30	50	33	33	28	28	23

Reference: Development of Time-and-Distance Guidelines For Use Of Theatrical Smoke Equipment: Rosco Delta 3000, prepared by ENVIRON International Corporation for Rosco Laboratories, May 2004

TIME-AND-DISTANCE GUIDELINES Rosco Delta 3000 (10% Setting)								
Fluid	Machine Setting	Release Duration (sec)	Time (in sec) After Which Air Concentrations Are Below Guidance Level (40 mg/m <sup>3</sup> )					
			3 ft	6 ft	9 ft	12 ft	18 ft	
Rosco Clear Fog Fluid	10%	60	130	130	130	130	73	
Rosco Fog Fluid	10%	60	58	0	58	58	0	
Rosco Light Fog Fluid	10%	60	30	0	0	0	0	
Rosco Stage & Studio Fluid	10%	60	63	13	13	13	0	

Reference: Development of Time-and-Distance Guidelines For Use Of Theatrical Smoke Equipment: Rosco Delta 3000, prepared by ENVIRON International Corporation for Rosco Laboratories, May 2004

**ROSCO LABORATORIES**

TIME-AND-DISTANCE GUIDELINES Rosco Delta Hazer with Delta Hazer Fluid							
Release Duration (secs)	Time (in sec) After Which Air Concentrations Are Below Guidance Level (40 mg/m <sup>3</sup> )						
	Machine Setting	3 ft	6 ft	12 ft	15 ft	21 ft	27 ft
30	100	0	0	0	0	0	0
60		0	0	0	0	0	0
300		0	0	0	0	0	0
600		0	0	0	0	0	0
30	50	0	0	0	0	0	0
60		0	0	0	0	0	0
300		0	0	0	0	0	0
600		X	X	X	X	X	X
60	30	0	0	0	0	0	0
300		X	X	X	X	X	X
600		X	X	X	X	X	X

Note: X = not tested, but results are expected to be comparable to those at the 100% machine setting.  
Reference: Development of Time-And-Distance Guidelines for Use of Theatrical Smoke Equipment: Rosco Delta Hazer, prepared by ENVIRON International Corporation for Rosco Laboratories, August 2006

TIME-AND-DISTANCE GUIDELINES Mini-V with Rosco 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
S5	On	40	0	0	0	0
15	On	80	30	0	0	0
30	On	80	30	0	0	0
60	On	80	40	0	0	0
120	On	80	40	0	0	0

Reference: Calibration Factors and Time-And-Distance Guidelines for Use of Theatrical Fog Equipment: Vapour with Rosco Stage & Studio Fluid, Vapour with Rosco Fog Fluid, Vapour Plus with Rosco Stage & Studio Fluid, Vapour Plus with Rosco Fog Fluid, Mini-V with Rosco Stage & Studio Fluid, Mini-V with Rosco Fog Fluid, and V-Hazer with V-Hazer Fluid, prepared by ENVIRON International Corporation for Rosco Laboratories, May 2014.

ROSCO LABORATORIES

TIME-AND-DISTANCE GUIDELINES Mini-V with Rosco Stage and Studio Fluid						
Release Duration (secs)	Time (in sec) After Which Air Concentrations Are Below Guidance Level (40 mg/m <sup>3</sup> )					
	Machine Setting	8 ft	11 ft	15 ft	20 ft	25 ft
5	On	15	0	0	0	0
10	On	15	15	0	0	0
30	On	15	15	0	0	0
60	On	15	15	0	0	0
120	On	20	15	0	0	0

Reference: [Calibration Factors and Time-And-Distance Guidelines for Use of Theatrical Fog Equipment: Vapour with Rosco Stage & Studio Fluid, Vapour with Rosco Fog Fluid, Vapour Plus with Rosco Stage & Studio Fluid, Vapour Plus with Rosco Fog Fluid, Mini-V with Rosco Stage & Studio Fluid, Mini-V with Rosco Fog Fluid, and V-Hazer with V-Hazer Fluid](#), prepared by ENVIRON International Corporation for Rosco Laboratories, May 2014.

TIME-AND-DISTANCE GUIDELINES Rosco PF-1000								
Fluid	Machine Setting	Release Duration (sec)	Time (in sec) After Which Air Concentrations Are Below Guidance Level (40 mg/m <sup>3</sup> )					
			3 ft	6 ft	9 ft	12 ft	15 ft	18 ft
Rosco Fog Fluid	Full	15	60	40	0	0	0	0
	Medium	15	60	0	0	0	0	0
Rosco Stage & Studio Fluid	Full	15	100	70	60	60	0	0
	Medium	15	100	70	0	0	0	0

Reference: [Equipment-Based Guidelines for the Use of Theatrical Smoke and Haze](#), prepared by ENVIRON International Corporation for the Equity-League Pension and Health Trust Funds, June 8, 2001.

**ROSCO LABORATORIES**

<b>TIME-AND-DISTANCE GUIDELINES V-Hazer with V-Hazer 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%	0	0	0	0	0
10	100%	0	0	0	0	0
30	100%	0	0	0	0	0
60	100%	0	0	0	0	0
120	100%	0	0	0	0	0
5	75%	0	0	0	0	0
10	75%	0	0	0	0	0
30	75%	0	0	0	0	0
60	75%	0	0	0	0	0
120	75%	0	0	0	0	0
5	50%	0	0	0	0	0
10	50%	0	0	0	0	0
30	50%	0	0	0	0	0
60	50%	0	0	0	0	0
120	50%	0	0	0	0	0
5	25%	0	0	0	0	0
10	25%	0	0	0	0	0
30	25%	0	0	0	0	0
60	25%	0	0	0	0	0
120	25%	0	0	0	0	0

Reference: Calibration Factors and Time-And-Distance Guidelines for Use of Theatrical Fog Equipment: Vapour with Rosco Stage & Studio Fluid, Vapour with Rosco Fog Fluid, Vapour Plus with Rosco Stage & Studio Fluid, Vapour Plus with Rosco Fog Fluid, Mini-V with Rosco Stage & Studio Fluid, Mini-V with Rosco Fog Fluid, and V-Hazer with V-Hazer Fluid, prepared by ENVIRON International Corporation for Rosco Laboratories, May 2014.

**ROSCO LABORATORIES**

<b>TIME-AND-DISTANCE GUIDELINES Vapour with Rosco 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>5 ft</b>	<b>8 ft</b>	<b>10-12 ft</b>	<b>15-16 ft</b>	<b>20 ft</b>	<b>25 ft</b>
5	100%	-	80	40	0	0	0
15	100%	-	80	40	0	0	0
30	100%	-	80	40	0	0	0
60	100%	-	80	40	10	0	0
5	75%	-	50	50	0	0	0
15	75%	-	60	50	0	0	0
30	75%	-	60	50	0	0	0
60	75%	-	90	50	30	10	0
5	50%	60	-	50	0	0	0
15	50%	60	-	50	0	0	0
30	50%	60	-	50	0	0	0
60	50%	60	-	50	20	0	0
120	50%	-	10	0	0	0	0
5	25%	50	-	0	0	0	0
15	25%	50	-	0	0	0	0
30	25%	60	-	0	0	0	0
60	25%	60	-	0	0	0	0
120	25%	60	-	0	0	0	0

Reference: Calibration Factors and Time-And-Distance Guidelines for Use of Theatrical Fog Equipment: Vapour with Rosco Stage & Studio Fluid, Vapour with Rosco Fog Fluid, Vapour Plus with Rosco Stage & Studio Fluid, Vapour Plus with Rosco Fog Fluid, Mini-V with Rosco Stage & Studio Fluid, Mini-V with Rosco Fog Fluid, and V-Hazer with V-Hazer Fluid, prepared by ENVIRON International Corporation for Rosco Laboratories, May 2014.

**ROSCO LABORATORIES**

<b>TIME-AND-DISTANCE GUIDELINES Vapour with Rosco Stage and Studio 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>11 ft</b>	<b>15 ft</b>	<b>20 ft</b>	<b>25 ft</b>
5	100%	10	10	10	0	0
10	100%	15	10	10	0	0
30	100%	15	10	10	0	0
60	100%	25	10	10	0	0
120	100%	30	10	10	0	0
5	75%	10	0	0	0	0
10	75%	15	10	0	0	0
30	75%	15	10	0	0	0
60	75%	15	10	0	0	0
120	75%	30	10	0	0	0
5	50%	10	0	0	0	0
10	50%	15	0	0	0	0
30	50%	15	0	0	0	0
60	50%	15	0	0	0	0
120	50%	20	0	0	0	0
5	25%	0	0	0	0	0
10	25%	10	0	0	0	0
30	25%	10	0	0	0	0
60	25%	15	0	0	0	0
120	25%	15	0	0	0	0

Reference: Calibration Factors and Time-And-Distance Guidelines for Use of Theatrical Fog Equipment: Vapour with Rosco Stage & Studio Fluid, Vapour with Rosco Fog Fluid, Vapour Plus with Rosco Stage & Studio Fluid, Vapour Plus with Rosco Fog Fluid, Mini-V with Rosco Stage & Studio Fluid, Mini-V with Rosco Fog Fluid, and V-Hazer with V-Hazer Fluid, prepared by ENVIRON International Corporation for Rosco Laboratories, May 2014.

**ROSCO LABORATORIES**

<b>TIME-AND-DISTANCE GUIDELINES Vapour Plus with Rosco 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>5 ft</b>	<b>8 ft</b>	<b>12 ft</b>	<b>16 ft</b>	<b>20 ft</b>	<b>25 ft</b>
5	100%	-	80	80	80	80	70
15	100%	-	100	100	100	100	70
30	100%	-	100	100	100	100	90
60	100%	-	180	100	100	100	90
5	75%	-	70	70	60	40	10
15	75%	-	100	100	100	100	50
30	75%	-	100	100	100	100	90
60	75%	-	100	100	100	100	90
5	50%	70	-	50	0	0	0
15	50%	70	-	50	30	0	0
30	50%	70	-	50	30	0	0
60	50%	90	-	50	30	0	0
5	25%	0	-	0	0	0	0
15	25%	0	-	0	0	0	0
30	25%	0	-	0	0	0	0
60	25%	0	-	0	0	0	0

Reference: Calibration Factors and Time-And-Distance Guidelines for Use of Theatrical Fog Equipment: Vapour with Rosco Stage & Studio Fluid, Vapour with Rosco Fog Fluid, Vapour Plus with Rosco Stage & Studio Fluid, Vapour Plus with Rosco Fog Fluid, Mini-V with Rosco Stage & Studio Fluid, Mini-V with Rosco Fog Fluid, and V-Hazer with V-Hazer Fluid, prepared by ENVIRON International Corporation for Rosco Laboratories, May 2014.



**ROSCO LABORATORIES**

<b>TIME-AND-DISTANCE GUIDELINES Vapour Plus with Rosco Stage and Studio 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>11 ft</b>	<b>15 ft</b>	<b>20 ft</b>	<b>25 ft</b>
5	100%	35	15	15	15	0
10	100%	35	20	15	15	0
30	100%	35	25	25	15	15
60	100%	35	30	30	30	30
120*	100%	240	240	160	160	105
5	75%	35	15	15	0	0
10	75%	35	20	15	10	0
30	75%	35	25	25	10	0
60	75%	35	30	30	25	25
120*	75%	240	240	160	160	105
5	50%	20	15	15	0	0
10	50%	20	15	15	10	0
30	50%	30	20	20	10	0
60	50%	35	30	30	15	15
120	50%	240	240	160	95	90
5	25%	20	0	0	0	0
10	25%	20	0	0	0	0
30	25%	20	0	0	0	0
60	25%	20	5	0	0	0
120	25%	45	5	0	0	0

\* Machine shut off two times for approximately 30 seconds total within the 120-second testing timespan

Reference: Calibration Factors and Time-And-Distance Guidelines for Use of Theatrical Fog Equipment: Vapour with Rosco Stage & Studio Fluid, Vapour with Rosco Fog Fluid, Vapour Plus with Rosco Stage & Studio Fluid, Vapour Plus with Rosco Fog Fluid, Mini-V with Rosco Stage & Studio Fluid, Mini-V with Rosco Fog Fluid, and V-Hazer with V-Hazer Fluid, prepared by ENVIRON International Corporation for Rosco Laboratories, May 2014.

**SMOKE FACTORY**

<b>TIME-AND-DISTANCE GUIDELINES</b>						
<b>Smoke Factory Tour Hazer II with Gotham Haze Fluid</b>						
<b>Release Duration (seconds)</b>	<b>Output (%)</b>	<b>Fan (%)</b>	<b>Time (in seconds) After End of Cue After Which Air Concentrations Are Below Guidance Level (40 mg/m<sup>3</sup>)</b>			
			<b>4 ft</b>	<b>8 ft</b>	<b>12 ft</b>	<b>16 ft</b>
300	99	99	20	20	0	0
300	75	99	0	0	0	0

Reference: Environmental Testing of Theatrical Fog Equipment: Tour Hazer II with Gotham Haze Fluid and Captain D with Gotham Fog Fluid, prepared by Ramboll, March 2023.

<b>TIME-AND-DISTANCE GUIDELINES</b>						
<b>Smoke Factory Captain D with Gotham Fog Fluid</b>						
<b>Release Duration (seconds)</b>	<b>Output (%)</b>	<b>Time (in seconds) After End of Cue After Which Air Concentrations Are Below Guidance Level (40 mg/m<sup>3</sup>)</b>				
		<b>4 ft</b>	<b>8 ft</b>	<b>12 ft</b>	<b>16 ft</b>	
5	75	0	0	0	0	
15	75	0	0	0	0	
30	75	40	20	0	0	
5	50	0	0	0	0	
15	50	0	0	0	0	
30	50	0	0	0	0	

Reference: Environmental Testing of Theatrical Fog Equipment: Tour Hazer II with Gotham Haze Fluid and Captain D with Gotham Fog Fluid, prepared by Ramboll, March 2023.

**ULTRATEC SPECIAL EFFECTS**

TIME-AND-DISTANCE GUIDELINES Ultratec Special Effects G100								
Fluid	Machine Setting	Release Duration (sec)	Time (in sec) After Which Air Concentrations Are Below Guidance Level (40 mg/m <sup>3</sup> )					
			3 ft	6 ft	9 ft	12 ft	15 ft	18 ft
Extra Quick Dissipating Fluid	On	15	100	40	40	40	30	30
Quick Dissipating Fluid	On	15	150	150	40	40	30	30
Director's Choice Fluid	On	15	150	30	30	0	0	0

Reference: [Equipment-Based Guidelines for the Use of Theatrical Smoke and Haze](#), prepared by ENVIRON International Corporation for the Equity-League Pension and Health Trust Funds, June 8, 2001.

TIME-AND-DISTANCE GUIDELINES Ultratec Special Effects G150								
Fluid	Machine Setting	Release Duration (sec)	Time (in sec) After Which Air Concentrations Are Below Guidance Level (40 mg/m <sup>3</sup> )					
			3 ft	6 ft	9 ft	12 ft	15 ft	18 ft
Extra Quick Dissipating Fluid	Full	15	50	40	40	30	30	30
	Medium	15	50	0	0	0	0	0
Molecular Fog Fluid	Full	15	90	50	40	0	0	0
	Medium	15	90	0	0	0	0	0
Quick Dissipating Fluid	Full	15	60	60	40	0	0	0
	Medium	15	60	0	0	0	0	0
Director's Choice Fluid	Full	15	110	80	70	70	0	0
	Medium	15	60	50	50	0	0	0

References: [Equipment-Based Guidelines for the Use of Theatrical Smoke and Haze](#), prepared by ENVIRON International Corporation for the Equity-League Pension and Health Trust Funds, June 8, 2001.

**ULTRATEC SPECIAL EFFECTS**

TIME-AND-DISTANCE GUIDELINES Ultratec G-3000							
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
Froggy's Fog Backwood Bay Fluid	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							
Froggy's Fog Amusement Park Fluid	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							
Froggy's Fog Bog Fog Fluid	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†	65%	70	70	60	60	60
	60	25%	60	0	0	0	0
	120†	25%	60	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							
Froggy's Fog Velocity Fluid	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							
Froggy's Fog Cryo Freeze Fluid	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

**ULTRATEC SPECIAL EFFECTS**

TIME-AND-DISTANCE GUIDELINES Ultratec G-3000							
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
	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 † Machine runs at significantly reduced output volume after 80 seconds						
Froggy's Fog Quick Blast Fluid	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 † Machine runs at significantly reduced output volume after 80 seconds							
References: <a href="#">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, Velocity/Cryo Freeze/Quick Blast/Training Smoke O, Techno Fog/Beam Splitter, Neutronic Haze, DaFiddy, Swamp Juice 2009 Formula, Light Fog</a> , prepared by ENVIRON International Corporation for Froggy's Fog, October 2014.							

TIME-AND-DISTANCE GUIDELINES Ultratec Handy Fogger							
Fog Fluid Used	Release Duration	Number of Hand Pumps	Time (in sec) After Which Air Concentrations Are Below Guidance Level (40mg/m <sup>3</sup> )				
			Height Above Ground				
	(secs)		5 ft	10 ft	15 ft	20 ft	25 ft
Director's Choice	15	5	15	25	25	0	0
	30	10	30	50	50	0	0
	60	20	60	50	50	10	0
Quick Dissipating	15	5	0	0	0	0	0
	30	10	20	20	10	10	0
	60	20	20	20	10	10	0
Pro Beam	15	5	15	15	0	0	0
	30	10	50	50	30	0	0
	60	20	140	140	40	10	0
Reference: <a href="#">Environmental Testing of Theatrical Fog Equipment: Handy Fogger</a> , prepared by Ramboll for Ultratec Special Effects, October 2020.							

**ULTRATEC SPECIAL EFFECTS**

<b>TIME-AND-DISTANCE GUIDELINES</b>						
<b>Ultratec Special Effects LSG MKII -PFI9D with Molecular 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>3 ft</b>	<b>6 ft</b>	<b>12ft</b>	<b>18 ft</b>	<b>30 ft</b>
30	100	0	0	0	0	0
60		0	0	0	0	0
120		0	0	0	0	0
300		0	0	0	0	0
30	50	0	0	0	0	0
60		0	0	0	0	0
120		0	0	0	0	0
300		X	X	X	X	X
30	10	0	0	0	0	0
60		0	0	0	0	0
120		0	0	0	0	0
300		X	X	X	X	X

Note: X = not tested, but results are expected to be comparable to those at the 100% machine setting

Reference: [Development of Time-And-Distance Guidelines for Use of Theatrical Smoke Equipment: Le Maitre LSG-MKII with Power Fog Industrial 9D \(PFI9D\) Low Smoke Generator](#), prepared by ENVIRON International Corporation for Le Maitre Special Effects, August 2006.

**ULTRATEC SPECIAL EFFECTS**

TIME-AND-DISTANCE GUIDELINES Ultratec Special Effects Radiance Hazer									
Fluid	Release Duration (secs)	Time (in sec) After Which Air Concentrations Are Below Guidance Level (50 mg/m <sup>3</sup> )							
		Fan speed/Haze output	3-4 ft	6 ft	8-9 ft	12 ft	15-16 ft	18 ft	20 ft
Neutron/ Luminous 7 Haze Fluid	30	100/100	5	5	5	5	0	0	-
	60		10	10	10	10	10	0	-
	180		10	10	10	10	10	0	-
	300		10	10	10	10	10	0	-
	180	50/100	0	0	0	0	0	0	-
	300		X	X	X	X	X	X	-
Froggy's Fog Neutronic Haze Fluid	30	9/9	20	-	20	20	20	-	20
	60		20	-	20	20	20	-	20
	120		30	-	30	30	30	-	30
	60	9/1	10	-	0	0	0	-	0
	120		30	-	30	0	0	-	0
	30	5/9	20	-	20	0	0	-	0
	60		40	-	40	40	0	-	0
	120		40	-	40	40	0	-	0
	30	1/9	0	-	0	0	0	-	0
	60		30	-	0	0	0	-	0
	120		30	-	0	0	0	-	0

Note: X = not tested, but results are expected to be comparable to those at the 180 second duration.

References: [Development of Time-And-Distance Guidelines for Use of Theatrical Smoke Equipment: Le Maitre Radiance Hazer](#), prepared by ENVIRON International Corporation for Le Maitre Special Effects, August 2006. [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, Velocity/Cryo Freeze/Quick Blast/Training Smoke Q, Techno Fog/Beam Splitter, Neutronic Haze, DaFiddy, Swamp Juice 2009 Formula, Light Fog](#), prepared by ENVIRON International Corporation for Froggy's Fog, October 2014.

**VOSENTECH**

<b>TIME-AND-DISTANCE GUIDELINES Vosentech MicroFogger 3 Pro with Fog Fluid</b>				
<b>Release Duration<sup>a</sup></b>	<b>Output Setting (%)</b>	<b>Time (in sec) After Which Air Concentrations Are Below Guidance Level (40mg/m<sup>3</sup>)</b>		
<b>(secs)</b>		<b>1 ft</b>	<b>2 ft</b>	<b>3 ft</b>
10	100	0	0	0
25	100	0	0	0
40	100	0	0	0
55	100	0	0	0
70	100	0	0	0
85	100	0	0	0

Note: <sup>a</sup>Releases were in 10 second bursts with five second intervals between bursts

Reference: Environmental Testing of Theatrical Fog Equipment: Vosentech Microfogger 3 Pro, prepared by Ramboll for Juniper Street Productions, October 2021.



**E-CIGARETTES, VAPE PENS, AND SIMILAR PRODUCTS**

<b>TIME AND DISTANCE GUIDELINES</b>				
<b>E-Cigarettes, Vape Pens, and Similar Products (Glycols and Glycerol Only)</b>				
<b>Duration of Drag (seconds)</b>	<b>Exhale Intensity</b>	<b>Average time (sec) after which air concentrations are below Guidance Level (40 mg/m<sup>3</sup>) at a distance of:</b>		
		<b>1 ft</b>	<b>2 ft</b>	<b>3 ft</b>
1	Weak	0	0	0
1	Strong	0	0	0
2	Weak	0	0	0
2	Strong	0	0	0
3	Weak	0	0	0
3	Strong	0	0	0
4	Weak	0	0	0
4	Strong	0	0	0
5	Weak	30	0	0
5	Strong	30	0	0

Notes: It should be noted that Ramboll's testing was limited to glycols and glycerol. Some of these products also contain small amounts of nicotine. Potential health effects associated with potential exposures to nicotine are not within the scope of Ramboll's review.

Testing of e-cigarettes and related products is limited to secondhand exposure after being exhaled by the user; the initial amount inhaled directly from the product was not measured.

Reference: Memo from Ramboll to Actors' Equity Association regarding Time & Distance Guidelines for E-Cigarettes and Vape Pens, March 28, 2024