Hi Folks

PLEASE pay attention to the following...

1. This is document is by no means perfect, in fact, it's a long way from perfection. It should also be considered as a 'work in progress'.

2. Nobody should take this and use it 'as-is'. It will require 'personalising' to your particular requirements.

3. Bear in mind that this was designed to meet the needs of the Authorities in the UNITED KINGDOM.

4. I offer it here as a document for improvement. At least it's better than having nothing at all and should give someone who has no idea where to start a reasonable document to start from.

5. **I accept no liability whatsoever should you find yourself in any sort of trouble by using this document. The onus is on YOU to make sure it meets your needs and the needs of anyone else BEFORE you use <u>any</u> part of it.**

6. I took the time (and spent the money) to attend a VERY worthwhile laser safety course run by LaserVisuals in the UK -- May I respectfully suggest that you do the same... or remove the bit about training from the policy.

If you need to contact me for any reason, please contact me via the Pangolin Forum http://www.pangolin.com/forums, my username is 'Jem'. May I respectfully suggest that you post any questions or comments about the document in the safety forum.

If you feel that your question warrants private discussion you can send me a Private message via the Pangolin Forum. However, I regret that I am unable to enter into any discussion as to the suitability of this policy for any specific purpose.

Finally, Laws and rules change all the time. This document was initially prepared in 2008 and updated in 2009. There are already areas that need further consideration, such as the new European regulations, which in theory will make it a criminal offence to illuminate a person at work with laser light in excess of the MPE (Or ELV-Exposure Limit Value, as it will be referred to in the new documentation).

Cheers

Jem

March 2010

Creativity With Lasers

Laser Show – Safety Policy / Risk Assessment / Contract

Introduction

This Record is produced by Xxxxxxxxxxx Lases as part of its general commitment to safety. It is intended to meet the requirements of Section 2 (General duties of employers to employees), Section 3 (Duties to persons other than employees), Section 6 (Designers, manufacturers and suppliers) and Section 7 (employees duties) of the Health and Safety at Work etc. Act 1974 and Regulations made under that Act, particularly the Management of Health and Safety at Work Regulations as amended 1999 and the Provision and Use of Equipment Regulations as amended 1998. Due consideration is taken of the British Standard covering laser safety (BS EN 60825-1:1994) and particularly current guidance from the Health and Safety Executive (HS(G)95) on the Radiation Safety of Lasers Used for Display Purposes.

The Record is presented in this form to ensure that all of the necessary information is available to enforcing officers, the venue management and the promoter.

Description of a Laser Display to be performed by

Xxxxxxxxxxx Lasers
Xxxxxxxxxxx
Xxxxxxx
Xxxxxxx
Xxxx Xxxx

Tel: Xxxxxx Xxxxxx / Mobile: Xxxxxx Xxxxxx

At _____

_____

_____

_____

Tel: _____

Contact: _____ Tel: _____

Date of event: **Start Time** **End Time**

_____ _____ _____

Description of the Event

Type: Beams ☐ Graphics ☐ SMS ☐ Advertising ☐ Public Order ☐ Other Promotion ☐

Expected Attendance: _____

The laser display is to take place: Indoors ☐ Outdoors ☐ Marquee ☐ Other ☐

Note: Outdoor events may require Civil Aviation Authority (CAA) clearance prior to the display taking place. Please see appendix at the end of this document for further information if the event is to be held outdoors.

Plan of Site

A plan of the site showing the layout of the stage (if available), audience, lasers and associated equipment is filed at the end of this document. Further plan and side elevations may also be included to show the extent of the laser beams in relation to the audience.

Lasers

The lasers(s) that will be used for this performance are detailed (and ticked) below.

☐ **Class 4 laser projector RGB (white light) laser projector containing the following lasers...**

Make:	Xxxxxxxxxxxx
Type:	2 x 225mW LED, combined using a polarised beam splitter cube
Type:	Diode
Wavelength:	659nm (Red)
Output power:	460mW Max
Beam Diameter:	~2.2mm
Divergence:	~1 mrad

Make:	Xxxxxxxxxxxx
Type:	Diode Laser
Wavelength:	640nm (Red)
Output power:	400mW Max
Beam Diameter:	~2.0mm
Divergence:	~1 mrad

Make:	Xxxxxxxxxxxx
Type:	Diode Pumped Solid State (DPSS)
Filter:	Infra Red filter fitted
Wavelength:	532nm (Green)
Output power:	500mW Max
Beam Diameter:	~2.0mm
Divergence:	~1 mrad

Make:	Xxxxxxxxxxxx
Type:	Diode Pumped Solid State (DPSS) 2 x 200mW DPSS, combined using a polarised beam splitter cube
Filter:	Infra Red filter fitted
Wavelength:	473nm (Blue)
Output power:	450mW Max
Beam Diameter:	~2.0mm
Divergence:	~1 mrad

Total Maximum Output power:
Will not exceed 2 watts total white light output

Galvonometers:
Xxxxxxxxxxxx

Optics and Mountings
Xxxxxxxxxxxx dichroic filters & Optical Mounts
Newport Research Corporation Optical Mounts

☐ **Class 4 laser projector 532nm (Green) laser projector containing the following lasers...**

Make:	Xxxxxxxxxxxx
Type:	Diode Pumped Solid State (DPSS)
Filter:	Infra Red filter fitted
Wavelength:	532nm (Green)
Output power:	1.5 watt Max
Beam Diameter:	~2.0mm
Divergence:	~1 mrad

Galvonometers:

Xxxxxxxxxxxx

Optics and Mountings

Newport Research Corporation Optical Mounts and front surface mirror

☐ **Class 4 laser projector 532nm (Green) laser projector containing the following lasers...**

Make:	Xxxxxxxxxxxx
Type:	Diode Pumped Solid State (DPSS)
Filter:	Infra Red filter fitted
Wavelength:	532nm (Green)
Output power:	1.5 watt Max
Beam Diameter:	~2.0mm
Divergence:	~1 mrad

Galvonometers:

Xxxxxxxxxxxx

Optics and Mountings

Newport Research Corporation Optical Mounts and front surface mirror

Laser Projector Safety features (applies to ALL laser projectors listed above):

The above lasers and mountings are built into a secure housing that cannot be accessed by the general public.

All projectors are key switch activated no laser emissions are possible without key.

Full interlock system linked to Key Activated Emergency Stop Button situated at laser control centre.

Remote computer blackout switch to immediately kill laser emissions

Metal plate scanner failure guards (manually adjusted prior to start of function), to prevent a static beam from being projected into the audience area in case of catastrophic scanner failure. This guard is also used to deflect and beams from being projected below the minimum permissible safe height determined for this particular venue.

Powerdrive heavy duty 'Tripod' secure wind-up projector stand for laser projector with safety locks.

Infrared emission filters fitted to all DPSS (Diode Pumped Solid State) lasers.

Laser Control Software:

We only use the very best Pangolin Professional Laser Show Software to control our lasers. Pangolin are the world leaders in providing computer control software to the laser entertainment industry. Pangolin are renowned for the ability to provide safe and highly effective laser shows. All Pangolin software incorporates the very latest safety features. Programs used:

Laser Show Designer LD2000:	Used for designing individual frames and effects for use with LD2000 / LivePRO
Showtime:	Used to playback synchronised shows designed with LD2000
LivePRO	A 'Live' player where beams/effects can be manually controlled in a 'Live' environment. This is especially useful for Disco's etc., where pre-planning all individual aspects of a laser show is not possible.
SMStoLaser:	Used for projecting 'Live' SMS text messages in scrolling Laser light.
AVS Visualliser:	Used to project pulsating effects in time to music (Similar to an oscilloscope waveform trace)

Other Equipment

The following is an inventory of the equipment, other than the lasers / software described above, which may or may not be brought onto the site as part of the laser display:

Pangolin QM2000.Net Laser control system

Computer systems: Compaq Laptop for main laser control software
Hewlet Packard Notebook PC for SMS software

ELO 21" touch screen monitor (Flight Cased)

Honda EU20i petrol 4 stroke generator. 240v AC pure sinewave output (I.P.66 rated RCD & multigang extension)

Powerdrive heavy duty 'Tripod' secure wind-up projector stand for laser projector with safety locks.

Analogue joystick (USB)

GPRS Modem (USB)

MIDI Controller: Behringer BCF2000

25Mhz sampling dual trace Oscilloscope

Fast silicon photodiode detector

Control cables: Cat 5 Network Cable

Power cables: Various

Custom bracket for mounting lasers on vehicle roof bars (out door events)

Haze generator(s)

Look Solutions Unique 2 Haze Generator:
Copy of specification sheet attached to this document for haze generator.
Copy of Safety Data Sheet / Material Safety Data Sheet attached to this document for haze fluid.

Laser Power Verification

We carry a portable Coherent 'Laser Check' Laser Power Meter and are happy to carry out laser power verification on site at the clients request. However, this service MUST be pre-booked with us at least ten days before the event is to take place. If this service is requested there may be an additional charge as we will have to arrive on site early.

Laser show Operator(s)

On this Occasion: Mr Xxxxxx Xxxxxx
+ Back up operator: _____

Mobile Telephone: Xxxxxx Xxxxxx

All Laser show operators are equipped with mobile telephones whilst on site.

All our laser operators are easily identifiable on site by badges. These badges are clearly marked 'Laser Show Operator' and show the operators name and Xxxxxxxxxxx Laser's telephone number.

Laser show Safety Officer

Mr Xxxxxx Xxxxxx Backup Operator: _____
Telephone: Xxxxxx Xxxxxx

The Laser Safety Officer is responsible for ensuring that the Company operates to a high level of safety at all times.

The Laser Safety Officer will be present at ALL times when the laser systems are operational. This is to ensure correct monitoring of the public, any signs of potential hazard will result in the laser emissions being immediately cut to ensure crowd safety.

Audience Scanning

☐ **Will take place at this event.** Please see appendix on Audience scanning at end of this document for further important information (only applicable if audience scanning is to take place).

☐ **Will NOT take place at this event** under ANY circumstances. All beams will be controlled so there is no possibility of a beam straying below a 3-meter level from ground. In addition to controls in computer software, a solid metal deflector shield arranged in front of the projector laser aperture backs up this audience protection by deflecting stray beams to safety zone. This deflector shield also protects the audience in the event of a catastrophic scanner failure.

During the risk assessment of the venue particular attention will be taken of any reflection hazards. If it is not possible to remove or cover these hazards it is possible through advanced features in the computerised laser control software to exclude these hazard zones using beam-blanking techniques.

Venue

The contract for the laser show is between Xxxxxxxxxxx Laser's and...

_____

_____

_____

_____

Tel: _____

Contact: _____

Tel: _____

The above named person is the main point of liaison between Xxxxxxxxxxx Laser's and the Venue. This named person is considered the Customer. The customer is jointly and severally liable for full settlement of all Xxxxxxxxxxx Lasers costs as detailed on the supplied quotation / invoice. Payment is required in advance of the show or on arrival on site in cash. If full settlement of fees is not made prior to the show we reserve the right to cancel the show.

Health and Safety Contact(s)

Any concerns relating to the provision of the laser show should be initially directed to Xxxxxxxxxxx Lasers directly. However, if further information is required that is outside the remit of the laser show company the customer should contact the following (usually the local authority health and safety department)...

Name: _____

_____

_____

_____

_____ Tel: _____

Email: _____

Emergency Assistance
In the first instance, the senior laser display operator from Xxxxxxxxxx Laser Shows will be responsible for immediate assistance in the event of an incident involving the Company's operations at the venue. It is the venue's full responsibility to ensure that First aid kits and appropriate fire extinguishers are available the whole time the Company representatives and its equipment are on site.

The Customer will at all times provide first aid cover for employees of Xxxxxxxxxx Lasers as part of its normal arrangements for its own employees.

Control Measures

Training
The Laser Display Company recognises that the main control measure to reduce the risk of injury to all persons is the quality of the training of its employees. The training of the employees involved with this show is as follows:

Name: Xxxxxx Xxxxxx + Other: _____

Formal Training provided by: LaserVisuals Ltd

Address: Xxxxxxxxxxxx
Xxxxxxxxxxxx
Xxxxxxxxxxxx
Xxxxxxxxxxxx
Xxxxxxxxxxxx

Telephone: Xxxxxxxxxxxx

Fax: Xxxxxxxxxxxx

Email: info@laservisuals.com

Website: http://www.laservisuals.com

Contact: James Stewart / Julie Stewart

Copy of training certificate(s) is attached to this document.

Engineering Controls
Where possible our laser display installations are designed to minimise the risk of injury to any person. As such, the laser and primary optical systems are rigidly mounted on the same base plate to minimise the risk of relative movement. All optical components are securely mounted with a minimum of two fixing bolts or screws. The optical path with the primary optics is constrained by the use of local shielding covers. The laser apertures are all masked. Although these masks are adjustable, they are secured after adjustment by fixing bolts.

The primary optical system is of a design that allows all adjustments on site to be made from above with the minimum of covers removed.

Security Arrangements
Each of the lasers is key operated. Once the laser is mounted in position and coupled to the primary optical system there are no accessible beam paths until the control system is activated.

Safety Signs
Each laser control area is designated a Laser Controlled Area when the key to the laser is in place (whether switched on or not). Signs are placed prominently at the entrance to each Laser Controlled Area as follows:

Caution Laser Starburst symbol with the legend "Laser Controlled Area"

Prohibition symbol with the legend "Laser Display Company Authorised Personnel Only"

The name of the responsible person and the Laser Safety Officer, along with details of how to contact them are also displayed.

Protective Eyewear
During normal operations and normal alignment work it is not necessary to wear laser safety eyewear. However two pairs of safety goggles are available should some unforeseen alignment work be necessary. These are designed to provide sufficient protection in the event of an accidental eye exposure.

Manufacturer: Bolle
Stated OD: 3
Stated wavelength: 450 – 540nm

Manufacturer: Bolle
Stated OD: 3
Stated wavelength: 630 – 670nm

Procedures for Alignment of lasers
All staff will work in a safe and responsible manner with due regard for their own safety and that of others.

Before powering up any of the equipment a check should be made of the layout and integrity of the power systems. The structural integrity of the support structure will be confirmed.

A particular concern during alignment work is the potential for accidental exposure to the laser radiation. To minimise the potential for this, the number of people in the vicinity will be minimised and, if reasonably possible, eliminated completely.

Alignment will always be carried out at the minimum power necessary and, where possible, will be carried out with the laser beam constrained, ie by using local shielding. It should be recognised that alignment with external optical components during daylight may require almost full power.

Emergency Arrangements
The most likely incidents during alignment relate to laser radiation exposure. During alignment with the primary optical system, the operator is at greatest risk. However, alignment with the secondary optics (if installed) may expose others. If an actual or suspected eye exposure occurs then a judgment will need to be made on the course of action.

If the incident involves a third party then they should be referred to an Optometrist. An employee of the Company will be encouraged to see an Optometrist within 24 hours. If the incident is judged to be of a serious nature they will be advised to attend the Accident and Emergency Department at the nearest hospital.

Other accidents and incidents could occur which relate to working at height, high voltages, etc.

Where appropriate, first aid should be applied and, if necessary, the relevant emergency services summoned.

Procedures for the Performance
These Procedures have been prepared for the performance of the laser display at the aforementioned venue. They should be seen as implementing, at least in part, Xxxxxxxxxx Lasers duties under Section 2 (General duties of employers to employees), Section 3 (Duties to persons other than employees), Section 6 (Designers, manufacturers and suppliers) and Section 7 (employees duties) of the Health and Safety at Work etc. Act 1974 and Regulations made under that Act, particularly the Management of Health and Safety at Work Regulations as amended 1999 and the Provision and Use of Equipment Regulations as amended 1998. Due consideration is taken of the British Standard covering laser safety (BS EN 60825-1:1994) and particularly current guidance from the Health and Safety Executive (HS(G)95) on the Radiation Safety of Lasers Used for Display Purposes.

Responsibilities
Those persons listed earlier in this document represent Xxxxxxxxxx Laser Shows on site.

Duties
All Xxxxxxxxxx staff will work in a safe and responsible manner with due regard for their own safety and that of others. Before powering up any of the equipment a check will be made of the layout and integrity of the power systems. The structural integrity of the support structure will be confirmed. Communication links (if necessary) between the operators will be confirmed prior to the commencement of the performance.

In most cases the show will have been pre-programmed and aligned to ensure that no members of the audience or other staff are at risk from stray beams and reflections. Where a 'Live' show is to be performed, all effects will have been pre-assessed and relevant ‘protection features’ put in place to ensure that no beams/reflections can be accidentally directed into the audience.*

***Audience Scanning:**
If the promoter has specifically requested audience scanning as part of a laser show a separate 'Audience Scanning' document will be attached to this document giving full details of the risks and extra measures that need to be taken to ensure the safety of the audience. In addition it will be necessary to document certain assessments that will have taken place to prove beyond reasonable doubt that the beams are safe to be scanned into the audience. This will include but is not limited to, Maximum Permissible Exposure (MPE's) calculations.

Emergency Arrangements
The lasers incorporate temperature sensors that turn the respective laser off in the event of overheating. Loss of power to the laser will automatically terminate the emission of laser radiation.

In the event of a developing situation in the audience, such as unruliness, the operator(s) is/are aware of the duty to immediately terminate the laser show if appropriate. Each operator can make this decision without reference to the other operators.

Failure of the control system or primary optics should result in a failure to safety due to the masking of the laser apertures. However, the operator will decide whether the performance from that laser can continue safely in any form.

If an actual or suspected eye exposure occurs then a judgment will need to be made on the course of action. If the incident involves a third party then they should be referred to an Optometrist, or depending on the severity of the exposure, the nearest Accident and Emergency Department. An employee of the Company will be encouraged to see an Optometrist within 24 hours.

Other accidents and incidents could occur which relate to working at height, high voltages, etc. Where appropriate, first aid should be applied and, if necessary, the relevant emergency services summoned.

Procedures for Dismantling

Introduction
These Procedures have been prepared for the dismantling of the laser display at the venue.

Duties
All staff will work in a safe and responsible manner with due regard for their own safety and that of others. Due consideration should be given to the lighting levels and the presence of members of the public and vehicles (particularly those from other employers).

Emergency Arrangements
The most likely incidents during dismantling relate to physical impact and falling. There should be no risk of injury from laser radiation. Where appropriate, first aid should be applied and, if necessary, the relevant emergency services summoned.

Risk Assessments
These risk assessments are provided in compliance with Xxxxxxxxxxx Lasers duties under Regulation 3 of the Management of Health and Safety at Work Regulations. Consideration is also given to the requirements for an Installation Safety Assessment in Chapter 4 of the Health and Safety Executive guidance HS(G)95 “The Radiation Safety of Lasers Used for Display Purposes”.

General
Xxxxxxxxxxx Lasers are committed to providing a safe environment for its employees and others who may be affected by its work activities, including members of the public.

What is covered here is transport from our premises to the venue, and from venue to venue; installation of the laser display at the venue; alignment and testing of the display; the performance; and dismantling.

Transport
The laser display system is transported from our premises to the venue in a vehicle owned by the proprietor of Xxxxxxxxxxx Lasers.

Vehicle: 4 wheel drive Xxxxxxxxxxxxx. Registration: Xxxxxxxxxxxxx. Colour: Xxxxxxxxxxxxx

IMPORTANT NOTE: Vehicular access is required to within 10 meters of laser equipment location. If this is not possible we require 14 days advance warning of the distance equipment has to be manually transported. Extra charges may be incurred depending on distance & whether we require extra labour to manually transport equipment.

Other vehicles: _____

Installation
Most of the risks during installation relate to the weight of some components of the laser display system and working at height. It is assumed for this assessment that none of the equipment is switched on.

Equipment Associated with the Lasers

Cables

Trip hazard Employees
Others in the vicinity
Consideration of cable routes.
Exposed cables will be covered with bright yellow & black striped high visibility tape.

Haze Generator(s)
Liquid spills
Heat

Alignment of Lasers
The alignment stage is considered to start as soon as power is applied to the laser or any of the associated systems. At the alignment stage it is assumed that covers may be removed from some of the equipment and the risk assessment takes this into account.

Lasers
The lasers are proprietary pieces of equipment which themselves comply with the requirements of the current British Standard on laser safety, BS EN 60825-1:1994. The lasers are maintained and adjusted at our premises prior to transport to the venue and no further on-site alignment or adjustment is envisaged. Therefore, this section is included for completeness only.

Hazard, Persons at Risk, Control Measures, Other Comments

High temperatures: Employees know which surfaces are at an elevated temperature. During normal operation (including alignment) the accessible surfaces are not sufficiently hot to cause a burn.

Laser radiation: Appropriate protective eyewear is available for alignment work.

Collateral radiation: Only one employee is permitted to work in the immediate vicinity with the covers removed. The duration of exposure is kept to a minimum.

If the Venue or Promoters have any particular cause for concern that has not been addressed in this document it should be brought to the attention of Xxxxxxxxxx Laser Shows in writing at least ten days before the event is to take place. We will always work with the Venue / Promoters to ensure a safe and enjoyable event..

P.A.T. (Portable Appliance Testing) & Electrical safety

All our equipment is P.A.T. Tested. Relevant up to date certification is available to view on request by interested parties. It is the responsibility of the venue to ensure that the power supply to our equipment is properly maintained and has all necessary safety verification.

Residual current detectors (RCD's) are used for outdoor events (I.P. 66 rated). If the event is to be held outdoors these devices will be supplied by Xxxxxxxxxx Lasers. However, for internal events it is the responsibility of the customer to provide a safe electricity supply with fitted RCD's. as part of the regular electrical circuit

Insurance
Xxxxxxxxxx Lasers carry third party liability insurance up to £5,000,000 and product liability insurance up to £1,000,000. Employer liability insurance is to a maximum of £2,000,000. Copies of the relevant certificates are attached to this document.

Identified Risks and control measures...

Following a visit to the venue on _____ 200__ the following risks have been identified...

1. Potential reflection hazard from surface mounted structures and/or wall surfaces

Control measure...

A] Mask off reflective surface with non-reflective material
or
B] Set up beam exclusion zone in computer software

Responsibility of:
Xxxxxxxxxxx Lasers

IMPORTANT NOTE:
Due to the temporary nature of marquees it will not be possible to undertake a full risk assessment until the day of the event.
Our experience indicates that there are unlikely to be any significant safety issues with relation to laser lighting effects in such a venue. However, any issues that are found will be addressed in full before the event can take place.

2. Potential trip hazard from cables

Control measure...

A] Lay cables around perimeter of venue at floor level, tape down with Hazard tape.
or
B] suspend cables around perimeter of venue but at above head height

Responsibility of:
Xxxxxxxxxxx Lasers

3. Potential hazard from public access to Laser Projector

Control measure...

A] Place laser projector on stage (set back from front) and restrict public access to stage area.

B] If no stage area is available the immediate area around the laser projector will be made into an exclusion zone by using suitable barriers. If no barriers are available high visibility hazard tape and suitable warning signs will be used.

Responsibility of:
Venue / Promoter / Xxxxxxxxxxx Lasers

4. Potential risk of fire alarm activation from use of Haze

Control measure...

A] One possible option to circumvent the activation risk is to ensure that smoke alarms in the area where haze is used are isolated, so that a full fire alarm activation cannot occur. This option may necessitate the appointment of a fire safety officer for the evening just in case a 'real' activation of the fire alarm occurs. Xxxxxxxxxxx Laser Shows will accept no responsibility for any fire alarm activation, it is the sole responsibility of the venue to ensure that all associated risks resulting from fire alarm de-activation are adequately managed.

Responsibility of:
Venue / Promoter

IMPORTANT NOTE:

Any risks that we, Xxxxxxxxxxx Lasers, have no control over (marked as responsibility of venue) should be addressed prior to us turning up on site for the performance. Should the risks that are the responsibility of the venue (shown above) not have been fully addressed we reserve the right to cancel the event, in which case the venue / promoter will be responsible for the full payment for the show as if the show had taken place. Cancellation will only be carried out as a last resort solely in the interests of public safety.

It should be especially noted that the identified risks above are only those risks which directly affect the public as a result of our being on site for the purposes of providing a public laser show at the aforementioned venue, time and date. It is expected that a general risk assessment will already have been undertaken by the venue for generic purposes. Xxxxxxxxxxx Lasers responsibility only extends to providing safe public entertainment on the particular date and time previously mentioned in this document.

If you are at all unsure about your responsibilities please contact us well in advance of the event taking place.

Look Solutions: Unique 2 Haze Fluid - Safety Data Sheet

Name: UNIQUE Fluid

Use: Smoke generator fluid

Description: Liquid aqueous mixture of triethylenglycol

Physical Properties:
Colourless liquid with nearly no odour.
Mixture with water.
May react violently with oxidising agents.
Avoid sources of ignition and naked flames.

Flash point (cc)	177° C
Boiling point at 1013 HPQ	288° C
Ignition temperature	370° C
Melting point	- 4 ° C
Vapour/air mixture	
is explosive min.	0.9 vol%
max.	9.2 vol%

Fire fighting use water spray, foam, CO2 or dry powder.

Health Hazard - Liquid form:
Irritant, corrosive to skin and eyes.
TOXICICITY: Oral 17000mg/kg of body weight
If ingested, may cause severe internal irritation and damage, nausea, headache, vomitting and central nervous system depression.
No evidence of carcinogenic properties.

Handling:

Gloves:	Rubber or plastic
Eye Protection:	Goggles or face shield
Other:	Wear plastic apron, selves and boots if handling large quantities

First Aid Procedures:
If in contact with skin, wash off with water.
If fog fluid gets in your eyes rinse out with liberal amounts of water.
If fog fluid gets ingested consult a doctor immediately.
If Inhaled then move to an outdoor environment, if the problem persists then seek medical attention.

Distributor:
Look Solutions
Planetenring 12
30952 Ronnenberg
Germany

Tel +49-(0)511-46 37 42
Fax +49-(0)511-46 37 11

Internet:
www.looksolutions.com

e-mail:
info@looksolutions

Look Solutions: Unique 2 Haze - Material Safety Data Sheet according to 91 / 155 / EWG

1. Product and Company Identification

Product name:	Haze fluid „Unique Fluid”
Supplier:	Look Solutions Planetenring 12 D-30952 Ronnenberg Tel: +49-511-46 37 42

2. Ingredients

Chemical Character:	Composition of Triethylenglycol and demineralized water
CAS-No:	112-27-6

3. Possible risks

Risks for human health:	None
Risks for environment:	None

4. First Aid Measures

General:	No special procedures
In contact with skin:	Wash off with water
In contact with eyes:	Rinse out with water. Obtain medical attention in case of any Irritation
Ingestion:	If swallowed do not induce vomiting. Rinse mouth with water, then drink water. Obtain medical attention in case of any Irritation

5. Fire-fighting Measures

The product is not flammable.

Extinguishing media:	Water spray, foam, CO2 or dry chemical
Special fire-fighting procedures:	None
Unusual fire and explosion hazards:	None

6. Accidential Release Measures

Leak and spill procedure:	Spilled fluid or splashed fluid droplets can cause slip hazard. Mop up the fluid and dispose of it according to regulations.
Personnel precaution measure:	None
Environmental protection:	Dilute with water. No dangerous substances will be released.

7. Handling and Storage

Technical protection measures:	Keep container tightly closed until use. Keep out of the reach of children.

8. Exposure Controls/Personnel Protection

The product does not contain any substances with limited values to be monitored at workplace.

Personnel protection:	Not necessary

9. Physical and Chemical Properties

Physical state:	liquid
Colour:	colourless
Odour:	neutral
1	
Melting point:	approx. - 4° C
Boiling point:	288° C
Flash point:	> 177° C

Ignition temperature:	> 370° C
Autoignition temperature:	min. 1,8 vol%, max. 9,2 vol%
Density:	1,08 - 1,10 g/cm3
Solubility in water (20° C):	Complete
pH:	ca. 6,5

10. Stability and Reactivity

Hazardous reaction:	None
Stability:	Stable under normal conditions. Reacts with oxidants.
Dangerous polymerisation: None	

11. Toxicological Properties

Acute oral toxicity:	The product has not been tested on animals
Skin:	None
Eye:	None
Sensitivity:	No sensitize effect known

12. Ecological and Ecotoxical Information

Biological degradation:	According to OECD-Guidelines biodegradable

13. Disposal Consideration

Product:	Dispose in compliance with all fedeal, state and local laws
Packaging:	Non-contaminated packaging may be recycled

14. Transport Information

ADR/RIP – GGVS/GGVE	Class: –	Item: –	
	Label: –	Substance-No: –	
	Proper shipping name: –		
ADR/ADNR	Class: –	Item: –	
	Proper shipping name: –		
IMDG/GGVSea	Class: –	UN-No: –	PG-No: –
	EmS-No: –	MFAG: –	Marine Pollutant: –
ICAO-TI-IATA-DGR	Class: –	UN/ID-No: –	
	PG: –	PAC: –	CAC: –
Additional Information:	No dangerous product according to the above mentioned Guidelines		

15. Regulatory Information

Labelling:	None
R-phrases:	–
S-phrases:	–
Water protection WGK:	None

16. General

The information contained herein is believed to be correct and corresponds to the latest state of scientific and technical knowledge. However, no warranty is made, either express or implied, regarding its accuracy or the results to be obtained from the use of such information.

Plan of Venue and other details