School of Physics, University of Exeter
CLASS 3B AND 4 LASERS - HAZARD AND RISK ASSESSMENT

Name of Assessor:		**Assessment Number**	
System Supervisor:		**Date of Assessment:**	

Class 3B and Class 4 lasers are capable of causing eye injury to anyone who looks directly into the beam or its specular reflections. In addition, diffuse reflections of a high-power (Class 4) laser beam can produce permanent eye damage. High-power laser beams (Class 4) can burn exposed skin, ignite flammable materials, and heat materials releasing hazardous fumes, gases or debris. Equipment and optical apparatus required to produce and control laser energy may also introduce additional hazards associated with high voltage, high pressure, cryogenics, noise, other forms of radiation, flammable materials, and toxic fluids. Thus, each proposed experiment or operation involving a laser must be evaluated to determine the hazards involved and the appropriate safety measures and controls required.

1 LOCATION OF THE ACTIVITY

2 LASER IDENTIFICATION AND SPECIFICATION

	Laser 1	Laser 2	Laser 3	Laser 4
Type:				
Manufacturer:				
Model:				
Serial #:				
Max. Power:				
Max. Pulse Energy:				
Wavelength Range:				
Wavelengths Used:				
Power Used:				
Pulse Energy Used:				
Pulse Length:				
Pulse Rep. Rate:				
Beam Diameter (x,y):				
Beam Shape:				
Beam Divergence (x,y):				
LASER CLASSIFICATION				

3 DESCRIPTION OF ACTIVITY OR RESEARCH

Provide a brief description of the laser set up, its purpose and operational parameters.

DURATION OF ACTIVITY/PROJECT *Is the work ongoing or for a limited period?*	

4 IDENTIFICATION OF NON-BEAM HAZARDS

Electrical Hazards

Most lasers contain high-voltage power supplies and often large capacitors that store lethal amounts of electrical energy.

Are any special precautions/procedures required? **Yes** ☐ **No** ☐

If yes, give details

Laser Dyes

Laser dyes are often toxic and/or carcinogenic chemicals dissolved in flammable solvents

Are laser dyes used? **Yes** ☐ **No** ☐

If yes, give details

Compressed and Toxic Gases

*Hazardous gases may be used in laser applications, i.e., excimer lasers (fluorine, hydrogen chloride)***.**

Are compressed or toxic gases used? **Yes** ☐ **No** ☐

If yes, give details.

Cryogenic Fluids

Cryogenic fluids can create hazardous situations. Adequate ventilation must be provided

Are cryogenic fluids used? **Yes** ☐ **No** ☐

If yes, give details.

Fumes/Vapours/Laser Generated Air Contaminants/Target Interactions

When laser beams heat up a target, the target may vaporise, creating hazardous fumes that may need to be exhausted.

Is there a potential for fumes/vapours/Laser Generated Air Contaminants? **Yes** ☐ **No** ☐

If yes, give details.

UV and Visible Radiation/ Plasma Emissions

UV and visible radiation may be generated by laser discharge tubes, pump lamps or plasmas

Is there a potential for significant UV/visible radiation? **Yes** ☐ **No** ☐

If yes, give details.

Explosion Hazards

Arc and, filament lamps, and capacitors may explode if they fail during operation. Optical components also may shatter.

Is there an explosion hazard? **Yes** ☐ **No** ☐

If yes, give details.

Other hazards not identified above.

Please specify.

RISK ASSESSMENT and CONTROL MEASURES

5	PERSONS WHO MAY BE AT RISK

6	MEASURES TO REDUCE LEVEL OF RISK (LASER BEAM HAZARD)		
	Are open or partially enclosed beams used during the following?	1. Initial setting up and beam alignment; 2. Addition of new optical elements/lasers; 3. Day to day operation 4. Maintenance	☐ ☐ ☐ ☐
	Are there protocols/procedures to control risks from the optical (and if applicable, skin) hazard?	1. Initial setting up and beam alignment; 2. Addition of new optical elements/lasers; 3. Day to day operation 4. Maintenance	☐ ☐ ☐ ☐
	List the operating protocols with References/dates/location. ALL OPEN BEAM WORK MUST HAVE AN APPROPRIATE PROTOCOL/OPERATING PROCEDURE		

7	INSTRUCTION/TRAINING *Authorised laser users must receive appropriate training and instruction*
	Specify the instruction and training arrangements
	A LIST OF AUTHORISED USERS IS TO BE DISPLAYED

8 PROTECTIVE EYEWEAR

Detail how OD was determined (Attach additional calculation sheet if necessary)

Number available	Location	Manufacturer	Wavelength range(s)	OD and EN207 Rating over specified wavelength range(s)

9 ASSESSMENT OF RISK (ASSOCIATED HAZARD identified in Section 4)

Detail the significant risks and the control measures necessary (i.e. by reference to protocols/procedures or safety manual).

For hazardous substances, specify the location of the appropriate COSHH assessments.

Hazard/Risk	Control Measure

10 MONITORING

Performance of control measures

It is the individual responsibility of each laser operator to follow the guidelines on laser safety.

Where control measures have failed or have been suspect then laser users should report these. Supervisors should monitor that users are complying with procedures as should the School and University Laser Safety Officers by carrying out periodic checks.

11 REVIEW

Enter the date or circumstances for review of assessment (maximum of 3 years or the length of the particular project if shorter.)

Where new lasers or components are introduced then these changes need to be assessed; protocols may need to be modified. A review would also be required where a new laser worker starts ensuring that they are informed of the relevant risks and protocols.

12 EMERGENCY ACTIONS

TO CONTROL HAZARDS

(E.g. turn off power source)

TO PROPECT PERSONNEL

(E.g. Evacuation, Special first aid)

TO RENDER SITE OF EMERGENCY SAFE

(E.g. turn off power)

13 EMERGENCY CONTACT DETAILS

Name:		**Mobile**	
Email Address:		**Ext.**	