Local Rules for the Use of the Leica TCS SP2 (Confocal Laser Scanning Microscope)

Location: 2_015 (CCMM Labs), Department of Materials Science and Metallurgy

Laser Safety Officer	Dr K.K. Koziol kk292@cam.ac.uk 34356
Laser Protection Adviser	University Laser Protection Adviser Health and Safety Division 16 Mill Lane, Cambridge Tel. ext. 66354 or 33301
Class A user • practical training • minor maintenance, nothing with open lasers	Mr Wayne Skelton-Hough wrh23@cam.ac.uk Tel. 67934 Dr Jennifer Shepherd jhr37@cam.ac.uk Tel. 34560
Issued under the authority of	Professor Serena Best
Version number and Date	Version Number 2 Date 05/11/13

Scope

These local rules cover the use of the Leica TCS SP2, a confocal laser scanning microscope (CLSM). They cover the day to day use of the microscopes which are effectively contained systems and their maintenance by trained service engineers. They implement the University's laser safety policy at a practical level and form part of the University's duties under Section 2(3) of the Health and Safety at Work etc Act 1974.

These rules cover only the use of the microscope and do not consider any risks associated with samples used. These risks should be covered by separate COSHH forms.

Description

CLSM used for immunofluorescence and live cell imaging.

The Leica TCS SP2 system is a fully automatic Laser Scanning Confocal Microscope equipped with three class III B lasers:

Laser Type	Wavelength (nm)	Maximum luminous power at laser output (mW)	Maximum luminous power in focal plane (mW)	Pulse duration
ArKr / Ar	458,476, 488, 514	<200	<50	Continuous wave (non-pulsed)
HeNe (green)	543	<1.5	<0.5	Continuous wave (non-pulsed)
HeNe	633	<15	<4	Continuous wave (non-pulsed)

The system is fully closed and laser areas accessed only by trained and authorised Leica technicians.

Authorised Users

Only persons who are adequately trained (by either Wayne Skelton-Hough or Jennifer Shepherd) and authorised by Wayne Skelton-Hough may work with the confocal microscope. Day to day users are trained only to use the CLSM as a laser containing microscope and may undertake no maintenance. More skilled users if trained by service engineers

can carry out minor maintenance activities (alignments, changing lens etc) but do nothing on open laser systems and do not work within the laser cavities. Factory trained Leica engineers carry out all tasks that involve access to laser cavities and fitting fibre optics for laser delivery.

Laser Controlled Area

The confocal microscope is in a small room with access off the main CCMM lab. Access can easily be restricted with suitable signage if service engineers are working within the laser cavity.

Procedures

1. Working within the laser cavities is only undertaken by service engineers.
2. Instruction is given to users to prevent any action that could reflect a laser beam towards themselves. They are instructed not to change samples or lenses while the laser is scanning and not to introduce anything reflective into the gap between the sample and the condenser lens (where the laser beam is in free air). They cannot disconnect fibre optics without the use of specific tools. They are told to stop the laser scanning while changing samples and to insert a physical beam blanker. A laser interlock automatically beam blanks when the condenser lens is tilted to allow access to the samples area above the objective lens that the laser beam exits.

Protection Measures

Access by service engineers is supervised by Wayne Skelton-Hough. Service engineers bring their own PPE.

Summary of Hazards

The major hazard (perceived as low risk due to the attenuation of the laser beam with distance from exiting the objective lens) is the possibility of exposure to the laser beam (see risk assessment).

The service engineers test the system for electrical safety as part of the service agreement. Ancillary portable electrical equipment undergoes regular PAT testing as part of the Department of Materials Science and Metallurgy safety policy.

Contingency Plan

If laser exposure is suspected and the user experiences symptoms, i.e. pain, blurred vision etc, medical assistance should be sought immediately (in the usual way for accidents in the department). If the user is symptomless, but exposure is suspected, the user's vision should be checked within 24 hours

Addenbrookes Hospital, Accident and Emergency Department
Hills Road, Cambridge CB2 2QQ UK, Tel: 01223 245 151.

All incidents must be reported to the Laser Safety Officer.

List of authorised users

<u>Class A users:</u>

Mr Wayne Skelton-Hough
Dr Jennifer Shepherd