Safety Handbook and Requirements

**Mechanics of Materials Division**

#### Mechanical Engineering Department, Imperial College London

The conduct of all members of the Department, whether staff, students or visitors, where it concerns the health and safety of themselves or others, is governed by the Health and Safety at Work Act 1974. All members of the Department are responsible for the health and safety of themselves and everyone else.

1. HEALTH AND SAFETY 3

1.2 First Aid Treatment 3

1.3 Blood Spillage 3

1.4 Eating, Drinking and Smoking in Laboratories 3

1.5 Drinking Water 3

2. INDUCTION PROCEDURES FOR NEW DIVISION MEMBERS 4

2.1 MoM Laboratory Managers 4

2.2 Safety Training Courses 4

3 REGULATIONS 5

3.1 Registration of Experimental Work 5

3.1.1 Choice, Purchase and Manufacture of Equipment 5

3.1.2 Planning, construction and testing of experimental apparatus – Pre-Registration of Experimental Work 5

3.2 College Safety Regulations 6

3.2.1 Work involving Lasers 6

3.3 Annual Registration of Laboratories: Safety Check Certificates 6

3.4 Control of Substances Hazardous to Health (COSHH) 7

3.5 The Pressure Systems & Transportable Gas Containers Regs. (1989) 8

3.6 The Electricity at Work Regulations 1989 8

3.7 Display Screen Equipment Regulations 1992 9

3.8 Manual Handling Regulations 1992 9

3.9 Noise at Work Regulations 1989 9

3.10 Provision and Use of Work Equipment Regulations 1998 10

4 LABORATORY PRACTICE 11

4.1 Access to Laboratories 11

4.2 Emergency Access to Laboratories 11

4.3 Training 11

4.4 Housekeeping 11

4.5 Security 12

4.6 Storage of Flammable Liquids 12

4.6.1 Limits of Quantity 12

4.6.2 Type of Storage 12

4.6.3 Where to Store 12

4.7 Use of Gas Cylinders 12

4.8 Liquid Nitrogen 13

4.9 Waste Disposal 13

4.9.1 Waste Solvents 13

4.9.2 Waste or Unwanted Chemicals 14

4.9.3 Broken and Waste Glassware 14

4.9.4 Chemical Spillages 14

4.10 Overnight Running of Apparatus 14

4.11 Working Outside Normal College Hours 14

4.12 Instruction in the Use of Fire Extinguishers 15

4.13 Reporting of Defects 15

5 Safety Checklist for New Laboratory Users 16

6 Appendix 17

Laboratory Safe Working Practices 17

# 1. HEALTH AND SAFETY

**1.1 Reporting of Accidents and Dangerous Occurrences**

 All incidents that are considered dangerous, whether or not these cause injury, **must** be reported to your Supervisor / Line Manager and the MoM Safety Officer (Suresh Viswanathan Chettiar, tel: 50380) who will report to the Departmental Safety Officer (DSO, Ian Wright) as soon as possible after the event.

## 1.2 First Aid Treatment

**During Working Hours:**

 In the case of injury the nearest “first aider” should be contacted – please see local lists on lab noticeboards under a green heading (changed every six months) - **OR** telephone the Health Centre (extension 49375 / 49376).

**Out of Hours:**

 Between 6 p.m. and 8 a.m. and at all times at weekends, first aid assistance can be obtained by contacting the Sherfield Security desk, extension 58920.

**In Emergency (Police/Fire/Ambulance) contact Security: PHONE 4444**

(give details of emergency, your exact location, telephone number & name)

## 1.3 Blood Spillage

 In the event of a spillage of blood **do not attempt to clean it up**; contact a first aider who will be aware of the correct procedure.

## 1.4 Eating, Drinking and Smoking in Laboratories

 Eating, drinking and smoking in the laboratories and workshops is prohibited.

Smoking is prohibited in the College.

## 1.5 Drinking Water

 There is a special supply for drinking water. All drinking fountains and taps marked 'Drinking Water', situated in most cloakrooms and some corridors, supply potable water. Water coolers are also available in some offices (e.g. 393, 540).

**Do not drink the water supplied to the laboratories**

# 2. INDUCTION PROCEDURES FOR NEW DIVISION MEMBERS

On arrival in the Mechanics of Materials Division (MoM Division), all new staff, students and academic visitors are given copies of the College Safety Policy Statement <http://www3.imperial.ac.uk/safety/policies/handspolicystatment> and the Departmental Safety Policy <http://www3.imperial.ac.uk/mechanicalengineering/safety> which they are required to read before being allowed to start work.

 All new students and lab-active RAs are required to attend the Department’s safety course, which is usually held in October, before they start work. If this is not possible, the Departmental Safety Officer (Ian Wright, i.wright@imperial.ac.uk) can make alternative arrangements.

## 2.1 MoM Laboratory Managers

 The primary regulators of safety in the Division are the MoM Laboratory Managers. These are currently as follows:

|  |  |  |  |
| --- | --- | --- | --- |
| **Lab.**  | **Laboratory Name** | **Manager/Technician** | **Tel.**  |
| 002/114 | Dynamic Fracture & Forming | Bamber Blackman | 47196 |
| 003 | Polymer Technology | Patrick Leevers | 47088 |
| 012  | High Temperature Testing | Kamran Nikbin  | 47133 |
| 013 | Thermal Mechanical | Jianguo Lin | 47082 |
| 500 | Adhesion & Adhesives | Ambrose Taylor | 47149 |
| 501a | Atomic Force Microscope | Bamber Blackman | 47196 |
| 508 | Soft Solids | Maria Charalambides | 47246 |
| 509 | Scanning Electron & Optical Microscope | Ambrose Taylor | 47149 |
| 581 | Materials & Mechanics Teaching | Maria Charalambides | 47246 |
| 595 | Metallurgy | Maria Charalambides | 47246 |
| 707 | Lab 707 | Maria Charalambides | 47246 |

In addition, matters of safety within MoM Division are dealt with by:

|  |  |  |
| --- | --- | --- |
| Ambrose Taylor  | MoM Safety Representative | 47149 |
| Suresh Viswanathan Chettiar | MoM Safety OfficerDeputy Departmental Safety Officer | 50380 |

For further assistance with safety issues please contact:

|  |  |  |  |
| --- | --- | --- | --- |
| Ian Wright  | Departmental Safety Officer | (DSO) | 47043 |

## 2.2 Safety Training Courses

 The Staff Development Unit runs a wide range of safety training courses. Details are available from <http://www3.imperial.ac.uk/staffdevelopment/safety>.

# 3 REGULATIONS

## 3.1 Registration of Experimental Work

###### All experimental work must be registered

**with the MoM Safety Officer and the relevant laboratory manager**

### 3.1.1 Choice, Purchase and Manufacture of Equipment

 You are required by law to use equipment that is safe for the use intended only. The onus is on you to ensure that you comply with this requirement. If in doubt as to the suitability of the equipment you propose to use, check with your supervisor or with someone with the necessary specialised knowledge.

 The following guidelines may assist you.

1. Equipment bought from a reputable manufacturer can usually be assumed to be safe to use for the purposes for which the manufacturer intended it. If you wish to use it for other purposes, first check with the manufacturer as to the advisability of this or, otherwise, with someone with the necessary specialist knowledge, for example the MoM Safety Officer.
2. Equipment formally ordered from workshops within the College (whether mechanical, electrical *etc*.) may be assumed to be safe for the purposes specified on the drawings you provide. They will exercise the necessary quality control to ensure that it conforms to the 'fitness for purpose' requirement. Note, however, that if they consider the design unsafe, they will refuse to make it.
3. Equipment made either by other workshops, or technicians working in their own time or by small outside jobbing firms should be assumed not to have received the necessary quality control and should not be assumed to be safe without further investigation. It is your responsibility and your supervisor’s to ensure that this investigation is carried out.

### 3.1.2 Planning, construction and testing of experimental apparatus – Pre-Registration of Experimental Work

 Pre-registration with the laboratory manager of experimental work is necessary where apparatus is being constructed. Information must be provided concerning the planned construction phase and the intended experiments. Sufficient detail is required concerning the proposed work to enable the laboratory manager, the MoM Safety Officer and in certain cases the DSO to decide whether a referee is needed to give advice.

 If hazardous substances will be used during the construction phase then a COSHH Risk Assessment Form must be completed.

 A standard operating procedure must be written for all equipment, and a copy kept with the equipment.

**3.1.3** Registration of Lab-Active Workers Form

 All laboratory users must complete an MoM ‘Registration of Lab-Active Workers’ form. Details must be given of the hazards, *e.g*. electrical, pressure, and flammable solvents, which might be encountered. Both the research worker and the supervisor must sign the document and the supervisor must ensure that the research worker has had relevant safety instruction and information. It will then be inspected by the MoM Safety Officer, who may recommend changes that are considered necessary to improve safety.

 **The registration is complete only when the Registration of Lab-Active Workers form has been signed by the MoM Safety Officer, Suresh Viswanathan Chettiar. Keep a copy of the registration form in your labbook, as the laboratory manager or technician may ask to see it.**

 Work on completed rigs or experimental work using existing rigs or commercial equipment must be registered with the laboratory manager, who will ensure that the user has been adequately trained and that a record of this training is kept. Registration of Lab-Active Workers and COSHH forms must be updated each time the experimental work changes.

Registration and COSHH forms are available from <http://www3.imperial.ac.uk/mechanicalengineering/safety>

## 3.2 College Safety Regulations

 The College Safety Policy covers all areas of health and safety that might affect those that work or study in the College. Associated with the Safety Policy are Codes of Practice which detail the restrictions and requirements which research workers must obey when working with lasers, radiation or biological materials, amongst other things. Full details can be obtained by reading the relevant Codes of Practice, available on the Imperial website, and the College Health and Safety Manual <http://www3.imperial.ac.uk/safety/subjects/management/safetyguide>.

### 3.2.1 Work involving Lasers

 All lasers must be registered and the Head of Department must approve all laser users. Any work involving the use of lasers is governed by the College Laser Code of Practice (refer to Policy Document PC-15 Lasers Class 3B and 4) <http://www3.imperial.ac.uk/safety/policies/individualpolicies>, and must be registered with the Departmental Laser Safety Supervisor, Prof. A M Taylor, room 602, ext. 47042, email a.m.taylor@imperial.ac.uk.

## 3.3 Annual Registration of Laboratories: Safety Check Certificates

 The DSO, in addition to the MoM Laboratory Managers and MoM Head of Division, carry out spot checks on all parts of the Department each term. Some faults are correctable on site, others require notification to the Head of Division. Where necessary the DSO will apply a ‘Stop Notice’ with 7 days to correct the fault.

 All laboratories, workshops, terminal rooms, lecture theatres and multiple occupancy rooms must be registered using the “Safety Check Certificate”. The Certificate is used as a method of ensuring that the standards of safety within an area are regularly reviewed. All equipment must be electrically tested, all experiments must be registered with the laboratory manager and all COSHH assessments must be up-to-date. Guidance on good housekeeping practices is included and information must be given about types of fume cupboards, warning signs and the protective clothing that is available.

 Failure to rectify any faults can result in the area being closed by the Laboratory Manager or the MoM Safety Officer until the relevant modifications have been carried out.

## 3.4 Control of Substances Hazardous to Health (COSHH)

 The COSHH Regulations 1999 are concerned with the control of exposure to substances in the workplace, which are deemed hazardous to health. The regulations require, amongst other things, that risk assessments be carried out on any hazardous substance before it is used in any job or activity. Risk assessments must be renewed annually or whenever the risk changes, whichever is the shorter period. The Department and MoM Division require all COSHH assessments to be renewed at the end of each calendar year. It is the responsibility of the user to ensure that all their COSHH assessments are renewed, and that the forms are countersigned by their supervisor.

 The user must complete a COSHH assessment if their work involves hazardous chemicals or substances. This assessment must be checked and signed by their supervisor, and also checked by the relevant lab manager. If the process or chemicals are changed, a new assessment must be completed.

 Guidance on how to carry out risk assessments is given in the Safety Unit’s Guidance Note 052: COSHH Assessments for Hazardous Chemicals <http://www3.imperial.ac.uk/safety/subjects/chemicalsafety/hazardouschemicals>. If there are any questions not covered by these notes, then Ambrose Taylor can help with completion of the form.

 Substances that are covered by the regulations are:

1) All substances specified by the Chemicals (Hazard Information and Packaging for Supply) Regulations 1994 (CHIPS) as dangerous to supply, i.e. very toxic, toxic, harmful, corrosive or irritant.

2) Any substance for which the Health and Safety Commission (HSC) has approved a Maximum Exposure Limit (MEL) or Occupational Exposure Standard (OES). MEL and OES values are listed in the current edition of "EH40 - Occupational Exposure Limits". An MEL must not be exceeded under any circumstances.

3) Biological agents.

4) Dust, of any kind, in sufficient quantities.

5) Any substance not included above but which is considered to be hazardous to health. Consult the material safety datasheet (MSDS).

 Substances that *are hazardous solely* *because* they are flammable, explosive or asphyxiates are not required to be assessed under COSHH, but see note **4.6** below.

 If you are using acetone, strain gauging adhesives or spray paint only, then you are covered by the general COSHH assessments held by the MoM Safety Officer. However, this use must be registered on the ‘Registration of Lab-Active Workers’ form, and you must obey the relevant COSHH assessment.

## 3.5 The Pressure Systems & Transportable Gas Containers Regs. (1989)

 These regulations govern the use of all pressurised equipment with the exception of certain low-hazard situations. The regulations apply to:

* Any vessel that is constructed with a permanent outlet to the atmosphere and which could become a pressure vessel if that outlet were obstructed.
* Any system of pipework containing steam (at any pressure).
* Any pressurised system of pipework containing a "relevant fluid". A relevant fluid is defined as:

a) a gas at a pressure in excess of 0.5 bar above atmospheric pressure.

b) a liquid which would have a vapour pressure greater than 0.5 bar above atmospheric pressure when in equilibrium with its vapour at either the actual temperatures of the liquid or 17.5 °C.

c) a gas dissolved under pressure in a solvent contained in a porous substance at ambient temperature, which could be released from the solvent without application of heat.

Note that a pressurised system containing only hydraulic oil or a similar liquid is exempt from the regulations whatever the pressure. The regulations are concerned only with gaseous, or at least partly gaseous, systems.

**If your pressurised system will contain (a) steam or (b) have a product of pressure (in bars above atmospheric) and volume (in litres) exceeding 250 bar litre, you must consult the MoM Safety Officer, Suresh Viswanathan Chettiar, who will arrange for the relevant vessels to be tested and recorded.**

 For further details see Imperial’s 027: ‘Safe Handling, Use and Storage of Compressed Gases <http://www3.imperial.ac.uk/safety/subjects/gasesandcryo>.

## 3.6 The Electricity at Work Regulations 1989

 All electrical equipment and plant in the Department is subject to regular testing and inspection as required by the Electricity at Work Regulations 1989. For further details see Imperial’s Guidance Note 019: Electrical Testing – PAT (January 2001) <http://www3.imperial.ac.uk/safety/subjects/workequip>.

 Electrical equipment in laboratories and other areas covered by a Laboratory Safety Check Certificate is normally inspected annually. All portable equipment, *e.g.* drills, must be tested every six months.

 Electrical equipment in all other areas in the Department, *e.g*. offices, which are not subject to an annual safety inspection, will be tested by arrangement between Mr Leroy Grey, the Department’s Electrical Tester and the MoM Safety Officer. An Electrical Testing Certificate will be completed.

 Testing equipment and advice can be obtained from the Electronics Workshop (Vim Patel). The responsibility for ensuring that the annual departmental check has taken place lies with:

 1. Laboratory Managers - for laboratories.

 2. Academic Staff - for their offices and those of their students and RAs.

 Trailing wires and extension leads must not be laid across gangways as they are a trip hazard. Wires should be routed around the walls and secured. If an alternative routing is not possible then wires across gangways should be covered with a cable-protector (available by the metre from Stores).

## 3.7 Display Screen Equipment Regulations 1992

 These Regulations require employers to carry out assessments of the risks to the health and safety of designated users of display screen equipment as a consequence of using such equipment. Mr Ian Wright, (Acting) Display Screen Co-ordinator and the DSO will inspect and make recommendations. Users are entitled to free eye and eyesight tests, on request, and free spectacles, if required. More information is available at <http://www3.imperial.ac.uk/occhealth/guidanceandadvice/computerhealth>.

## 3.8 Manual Handling Regulations 1992

 The aim of these Regulations is to reduce the amount of damage caused to people at work by incorrect manual handling. Before carrying out manual handling, task assessments should be made and, if possible, mechanical handling equipment should be used instead. Students are not allowed to collect their own gas bottles – contact the MoM Safety Officer or a technician. All the technicians are trained in manual handling and transport of gas bottles.

 More information is available in the Imperial Health and Safety Manual <http://www3.imperial.ac.uk/safety/subjects/management/safetyguide> (Workplace safety, Lifting and manual handling), and Guidance Note 020: Summary of Health and Safety Legislation, <http://www3.imperial.ac.uk/safety/subjects/management>.

## 3.9 Noise at Work Regulations 1989

 These Regulations are designed to ensure that any excessive noise is controlled and that workers wear suitable personal protective equipment above certain noise levels.

 If you believe that the environment in which you are working is excessively noisy, contact the MoM Safety Officer who will arrange to have a sound survey carried out.

 Consult the Library for the HSC 1989 Regulations, Approved Code of Practice / Health and Safety Commission.

 More information is available in the Imperial Health and Safety Manual <http://www3.imperial.ac.uk/safety/subjects/management/safetyguide> (Workplace safety and Noise), and Guidance Note 020: Summary of Health and Safety Legislation <http://www3.imperial.ac.uk/safety/subjects/management>.

## 3.10 Provision and Use of Work Equipment Regulations 1998

 These regulations are aimed at safeguarding the health and safety of employees from hazards arising from the provision and use of work equipment. Training is given in the safe use and maintenance of equipment and what do if things go wrong. Suitable guarding for mechanical hazards and protection against other dangers are in use. Suresh Viswanathan Chettiar, MoM Safety Officer, can advise on individual lab problems to do with the guarding of machinery. Refer to the Imperial Health and Safety Manual <http://www3.imperial.ac.uk/safety/subjects/management/safetyguide> (Laboratory and workshop safety, Machinery), and Guidance Note 020: Summary of Health and Safety Legislation <http://www3.imperial.ac.uk/safety/subjects/management>.

# 4 LABORATORY PRACTICE

## 4.1 Access to Laboratories

 All personnel working in a laboratory must have authority from their supervisor and the laboratory manager.

 All personnel who will work in laboratories must complete a ‘Registration of Lab-Active Workers’ form (see Section 3.1.3). Both the research worker and the supervisor must sign the document and the supervisor must ensure that the research worker has had relevant safety instruction and information.

## 4.2 Emergency Access to Laboratories

 The doors to the laboratories should be left unlocked when users are working inside. Keys to the doors into all laboratories are held in the office of the MoM Safety Officer (Mr Suresh Viswanathan Chettiar).

## 4.3 Training

 All personnel must ensure that they have had instruction about the safe use of all the equipment they are using from a member of the **technician staff** or of the **academic staff** before they operate the equipment.

 No-one will be allowed to operate equipment unless their supervisor and the laboratory manager agree that the person can operate the equipment in a safe manner in accordance with all College safety procedures.

 The user must ensure that the laboratory manager has made a written record of the training given. These training records will be checked frequently by the Divisional Safety Representatives, and any users whose training has not been recorded will be barred from the laboratories.

 The safety instructions by each piece of equipment are to be followed at all times. If any problems arise then please inform Prof. Jianguo Lin, Mr. Suresh Viswanathan Chettiar (MoM Safety Officer) or one of the technicians – do **not** “press on regardless”.

 No UG or MSc student may operate any equipment in the new DFF or PACT Laboratories unless they have completed a risk assessment, been trained to do so AND are accompanied by a trained PhD student/RA or Technician.

## 4.4 Housekeeping

 A tidy laboratory is much safer than one full of clutter; good housekeeping is essential for a safe environment. Keep passageways clear. Fire doors should not be locked, bolted or obstructed. Electrical cables should be off the floor, and cable ducting should be used where necessary. Laboratory doors should be left unlocked when users are working inside.

**No person may carry out hazardous work in a laboratory without a second person being within call**

## 4.5 Security

 Regrettably thefts do occur in College from time to time. Please do not bring valuables to College if at all possible. Always make sure your room is locked when you leave it, even for a short time and restrict access to those working in the lab. Lock away wallets, handbags etc if you are leaving your room.

## 4.6 Storage of Flammable Liquids

 There are legal requirements governing the storage of flammable liquids; some of the more important points are as follows:

### 4.6.1 Limits of Quantity

The COSHH assessments restrict the amount of flammable liquids kept in store. The cost of the disposal of excess liquids will be met by the Division and this is considerable. Any operations involving the storage or use of large quantities of flammable liquids should be discussed with the MoM Safety Officer.

### 4.6.2 Type of Storage

 By law containers of flammable liquids of greater than 500 ml capacity must be stored in approved, fire resisting storage cabinets or cupboards when not in use. The cupboard should be suitably labelled. Signage is examined by College Safety Unit, Ian Gillett, in general. Flammable liquids may be stored in fume cupboards only if they are contained in a suitable steel cabinet.

### 4.6.3 Where to Store

 Flammable liquid storage cabinets should not be sited in those parts of the laboratory where there is a high rate of movement of personnel. They should also be sited away from gas cylinders and ignition sources, *e.g.* naked flames and high temperature surfaces.

**All flammable substances should be kept apart from oxidising agents**

## Use of Gas Cylinders

 All cylinders should be secured, individually, to a rigid support using an appropriate clamp. Always keep the number of gas cylinders in the laboratory to a minimum and return empty or unwanted cylinders to the Stores.

 Keep cylinders away from stocks of flammable liquids and ignition sources.

 Do not clamp cylinders to the front of a fume-cupboard as they restrict the airflow, invalidating the classification of the cupboard.

 After use, always close the *valves* and depressurise the *regulator*. Be especially careful when using oxygen cylinders and make sure that the regulator is in the unpressurised position before opening the cylinder valve. Several explosions have occurred as a result of perforation of the regulator diaphragm, when opening oxygen cylinders with the regulator in the pressurised position.

 For guidance on the use, handling and storage of gas cylinders refer to the Imperial Guidance Note 027: Safe Handling, Use and Storage of Compressed Gases <http://www3.imperial.ac.uk/safety/subjects/gasesandcryo>.

## 4.8 Liquid Nitrogen

 All liquid nitrogen users must be aware of the properties and hazards, and be fully trained in the local departmental procedures for usage, storage and transportation before they engage in handling the substance. Refer to the Imperial Guidance Note 015: Storage, Use and Transportation of Liquid Nitrogen within College Premises <http://www3.imperial.ac.uk/safety/subjects/gasesandcryo>.

 Users should check with the MoM Safety Officer to establish whether a risk assessment for the handling and use of liquid nitrogen has been completed for the laboratory in which they are working. If not, a risk assessment and safety calculations must be completed prior to starting any work using liquid nitrogen.

 Only authorised users may transport dewars containing liquid nitrogen. The MoM Safety Officer keeps a list of authorised users, and must be notified in advance so that safe transport can be arranged. Pressurised and non-pressurised dewars containing liquid nitrogen should not be accompanied in lifts.

**Pressurised vessels and dewars should NOT be accompanied in lifts**

 Personal protective equipment must be worn when working with liquid nitrogen and dewars. Operating procedures for transporting, decanting and using liquid nitrogen dewars are available from the MoM Safety Officer.

 In the case of a spillage or leak of liquid nitrogen, evacuate the area immediately and follow the emergency procedure. Leaks or spillages must be reported as detailed in the emergency procedure.

**A leak or spillage of liquid nitrogen can kill you.**

**Evacuate the area IMMEDIATELY and follow the emergency procedure.**

## 4.9 Waste Disposal

**NO CHEMICALS MAY BE PUT INTO THE DRAINS OR PLACED IN THE DOMESTIC WASTE BINS.**

**It is ILLEGAL to dispose of organic solvents down the drains**

###

### 4.9.1 Waste Solvents

 Waste solvents should be stored in special polythene containers marked either "Chlorinated" or "Non-Chlorinated". Empty containers can be obtained from the MoM Safety Officer. When full, the MoM Safety Officer should be contacted to arrange for the disposal of the containers. Waste solvents mixed with more than 10% water or acid should be stored in glass Winchesters.

### 4.9.2 Waste or Unwanted Chemicals

 These should be given to the MoM Safety Officer who will arrange for them to be put in the Departmental Chemical Store or for their safe disposal.

### 4.9.3 Broken and Waste Glassware

DO NOT PUT GLASS OR SYRINGE NEEDLES IN THE DOMESTIC WASTE BINS.

 'Sharps' *i.e.* syringes, scalpel blades, glassware that cannot be cleaned *etc*., must be put in special waste containers that can be obtained from the MoM Safety Officer. When full, the MoM Safety Officer should be contacted to arrange for the disposal of the containers. Clean, broken glass may be placed in a clearly labelled box and left for the cleaners to take for recycling.

### 4.9.4 Chemical Spillages

 In the event of a chemical spillage contact the Technical Head of Division, Suresh Viswanathan Chettiar, tel: 50380.

**ALL MERCURY SPILLAGES MUST BE PROPERLY DEALT WITH -**

**CONTACT THE MoM Safety Officer (SURESH VISWANATHAN CHETTIAR)**

## 4.10 Overnight Running of Apparatus

 Any experiment or piece of apparatus that is left running overnight must be notified to the laboratory manager. An 'Overnight Running' notice must be displayed near the apparatus indicating the shutdown procedure. Blank notices can be obtained from the MoM Safety Officer, Suresh Viswanathan Chettiar.

## 4.11 Working Outside Normal College Hours

**NO ONE MAY CARRY OUT EXPERIMENTAL WORK ALONE UNLESS THE WORK HAS BEEN DECLARED NON-HAZARDOUS AND AUTHORISED BY HIS OR HER SUPERVISOR AND THE LABORATORY MANAGER.**

**A second person must be in the same laboratory at all times.**

 Any out of hours work in the laboratories must be authorised by the user’s supervisor and the laboratory manager. Forms are available from the MoM Safety Officer, Suresh Viswanathan Chettiar. A new form must be authorised for every day of out of hours working. The completed form must be displayed by the entrance to the relevant laboratory. The user must be accompanied by another person in the laboratory at all times.

 For Lone Out of Hours Working Basic Guidelines, refer to the Imperial Health and Safety Manual, <http://www3.imperial.ac.uk/safety/subjects/management/safetyguide> (Personal safety, Working alone), and Guidance Note 023: Lone Working, <http://www3.imperial.ac.uk/safety/subjects/management>.

 Only personnel with a valid security pass (swipe card) may enter or leave the Department out of hours.

 Access is available from 07.00 to 18.30 Monday to Friday. Outside these times and at weekends, access to the Department is *via* a swipe card. Everyone must leave the building by 23.00 hrs.

**College Closure Periods:** During the College closure periods at Christmas and Easter access is only allowed to members of the Department with a valid security pass.

**No experimental work is allowed during College closure periods**

**without the permission of the Head of Department**

## 4.12 Instruction in the Use of Fire Extinguishers

 All technician staff are required to attend training in the use of fire extinguishers. Fire safety for laboratory users is covered in the Departmental safety lecture. Training courses for laboratory users in the use of fire extinguishers are available via the Staff Development Unit, see Imperial website <http://www3.imperial.ac.uk/staffdevelopment/safety>.

## 4.13 Reporting of Defects

 Any building defects, *e.g*. broken lights, dangerous ceiling tiles, defective fume cupboards, dangerous floors, etc., should be reported immediately to the MoM Safety Officer, or direct to the Facilities Management Customer Services Centre on ext. 48000 or using the report fault link on <http://www3.imperial.ac.uk/facilitiesmanagement/helpdesk>. The Facilities Management Helpdesk service is for *building defects only* and not rig defects.

Author: Ambrose Taylor

Date: October 2012 Revision Due: October 2013

# 5 Safety Checklist for New Laboratory Users

|  |  |
| --- | --- |
| 1. | Read College and Departmental Safety Code of Practice<http://www3.imperial.ac.uk/safety/policies/handspolicystatment><http://www3.imperial.ac.uk/mechanicalengineering/safety> |
| 2. | Read MoM Safety Handbook<http://www3.imperial.ac.uk/mechanicalengineering/safety> |
| 3. | Complete web-based Month One Safety Training (MOST)<http://www.imperial.ac.uk/safety/most/> |
| 4. | Complete Risk Assessment Foundation Training (RAFT) if relevant<http://www3.imperial.ac.uk/staffdevelopment/safety/index/raft> |
| 5. | Fill out MoM Registration of Lab-Active Workers Form<http://www3.imperial.ac.uk/mechanicalengineering/safety> |
| 6. | Obtain Material Safety Data Sheet (MSDS) for each chemical used  |
| 7. | Read instructions for completing COSHH form (Guidance Note 052)<http://www3.imperial.ac.uk/mechanicalengineering/safety> |
| 8. | Fill out Risk Assessment for an Activity Involving the Use of Hazardous Chemicals (COSHH form) if relevant<http://www3.imperial.ac.uk/mechanicalengineering/safety> |
| 9. | See relevant laboratory managers and be trained to use laboratory equipment(Ensure that the lab manager records your training in the lab training record.) |

# 6 Appendix

**Mechanics of Materials Division**

**Mechanical Engineering Department**

## Laboratory Safe Working Practices

1. All personnel working in the laboratory must have authority from their supervisor and the laboratory manager; who agree that the person can operate the equipment in a safe manner in accordance with all College safety procedures.
2. The safety instructions by each piece of equipment are to be followed at all times. If any problems arise then please inform Prof. Jianguo Lin, Mr. Suresh Viswanathan Chettiar (MoM Safety Officer) or one of the technicians – do **not** “press on regardless”.
3. All personnel must ensure that they have had instruction about the safe use of all the equipment they are using from a member of the **technician staff** or of the **academic staff** before you operate the equipment. A written record of this training must be kept by the laboratory manager.
4. All laboratory workers must complete a ‘Registration of Lab-Active Workers’ form, which must be checked and signed by their supervisor and by Mr. Suresh Viswanathan Chettiar (MoM Safety Officer) prior to commencing work.
5. Laboratories are open for use from 08.30 to 17.00 Monday to Friday during normal College open dates. The **“Building and Laboratory** **Access”** doc on the safety website. <http://www3.imperial.ac.uk/mechanicalengineering/intranet/safety>.
6. Anyone needing to use equipment outside of these times may be allowed to do so by prior arrangement, with a signed authority from the laboratory manager and their supervisor. Two people must be present in the laboratory at all times.
7. If equipment is running outside of normal hours it must have a ‘Leave on Overnight’ notice filled in and displayed by the side of the equipment.
8. Any experiment involving new test equipment, or a different test procedure, must be cleared for safe operation by the laboratory manager, and with the Departmental Safety Officer if then considered necessary.
9. If the work involves hazardous substances then a COSHH assessment must be completed and checked by Mr. Suresh Viswanathan Chettiar (MoM Safety Officer) and, if considered necessary, by the Departmental Safety Officer Mr. Ian Wright prior to work commencing.
10. Any electrical equipment, especially “modifications”, that are installed must be checked by the Department’s electrical technicians for safe use and working.
11. The use of LASERS must first be discussed and cleared with Prof. Alex Taylor (Departmental LASER Safety Officer).
12. At any time safety queries may be referred directly to Mr. Suresh Viswanathan Chettiar (MoM Safety Officer), or the Departmental Safety Officer Mr. Ian Wright.
13. **Please remember, if in doubt about the safety of any piece of equipment, or experimental procedure, then ASK!!!**