Local Rule: Lead

1. Potential Health Effects of Lead

Staff or students can be exposed when handling, processing, repairing, maintaining, storing or disposing of lead or items containing lead. Lead can enter the body through the following routes:

- inhalation e.g. lead dust, fume or vapour;
- ingestion e.g. lead powder, dust paint or paste ingested while eating, smoking or drinking without washing hands or face; or
- absorption through the skin e.g. lead alkyls and lead naphthenate.

Where lead is not in a form that can be inhaled, ingested or absorbed then there is no risk of lead poisoning. For example lead being used as a shielding material for some ionising radiations.

When lead enters the body it will circulate in the blood. Small amounts will be excreted in urine but some will remain in the body accumulating in the bones. If levels of lead in the body get too high they can cause headaches, tiredness, irritability, constipation, nausea, stomach pains, anaemia or loss of weight. An unborn child is particularly at risk from exposure to lead, especially in the early weeks of pregnancy before a pregnancy becomes known.

Continued uncontrolled exposure can cause more serious symptoms such as:

- kidney damage;
- nerve and brain damage; and
- infertility.

The University aims to manage risks from lead by fulfilling the requirements of Control of Lead at Work Regulations 2002.

2. Key Definitions

Lead – means lead (including lead alkyls, lead alloy, any compounds of lead and lead as a constituent of any substance or material) which is liable to be inhaled, ingested or otherwise absorbed by persons except where it is given off from the exhaust system of a vehicle on a road.

Lead Alkyls – means tetraethyl lead or tetramethyl lead.

*Occupational Exposure Limit for Lead (other than lead alkyls) – the concentration of lead in the atmosphere to which staff may be exposed, which is set at 0.15 mg/m³.

*Occupational Exposure Limit for Lead Alkyls – the concentration of lead contained in lead alkyls in the atmosphere to which staff may be exposed, which is set at 0.10 mg/m³.

*Please note that the Control of Lead Regulations 2002 came into effect before the introduction of Workplace Exposure Limits hence the reason for still referring to Occupational Exposure Limits.

Significant Exposure - means exposure to lead in the following circumstances:

a) where any member of staff is or is liable to be exposed to a concentration of lead in the atmosphere exceeding half the occupational exposure limit for lead;

b) where there is a substantial risk of any member of staff ingesting lead; or

c) where there is a risk of contact between the skin and lead alkyls or other substances containing lead which can be absorbed through the skin.

3. Departmental Roles

3.1. Nominated Co-ordinator

Head of Department must nominate a person to:

- co-ordinate the arrangements for identifying and assessing risks arising from staff and students exposure to lead;
- regularly check that Principle Investigators or managers are implementing the arrangements by requesting to view updated risk assessments; and
- provide support where necessary e.g. requesting the services of the Occupational Hygienist.

Where medical surveillance is required, to liaise with Occupational Health Service to establish a surveillance programme, keep records of people who have attended and where recommendations are made by Occupational Health, to co-ordinate any action as necessary.
3.2. Staff
Staff and students have a responsibility to comply with the procedures put in place to prevent or reduce exposure to lead. In particular all staff have a duty to report any defects discovered in any of the control measures to their manager. Although risk assessments will take cognisance of women of reproductive age, pregnant workers should notify their manager or Head of Department at the earliest opportunity in order for a New and Expectant Mothers risk assessment to be conducted.

4. Assessing Risks from Lead
4.1. Identifying Lead Hazards
Lead hazards can only be assessed once it is known which departmental activities involve the use of lead that can be inhaled, ingested or absorbed. Some examples of activities where there is a significant risk of exposure are:

- high temperature lead work (above 500°C) e.g. lead burning, welding and cutting;
- abrasion of lead giving rise to lead dust in air, e.g. dry sanding, grinding, cutting by power tools; and
- spraying of lead paint and paint stripping.

Therefore, departments must take steps to identify work activities where staff and students may be exposed e.g. where lead is used in combination with other hazardous substances. This could involve reviewing substances and materials purchased, observing work activities, reviewing processes or from discussions at safety committees. Where substances or preparations containing lead are classified as dangerous for supply under the Chemicals (Hazard Information and Packaging for Supply) Regulations (CHIP) 2009 and/or European Classification Labelling and Packaging Regulations 2008, the supplier must provide an accompanying safety data sheet. This will contain relevant information about the hazards and controls to be considered when evaluating the risks.

It is advisable to maintain a list of lead activities which can be used to monitor and review the risks affecting the department.

4.2. Evaluating Risks
Staff and students must not be allowed to work with lead unless a risk assessment has been conducted. Therefore it is important that new projects or work activities involving lead are risk assessed prior to work commencing.

Within the University, the background information required to effectively evaluate the risks is collected jointly between the department and an Occupational Hygienist who is engaged via Safety Services. Departments must gather further information about the extent of exposure e.g. level, type, duration of exposure and the people potentially exposed.

The Occupational Hygienist will conduct on site measurements for each activity where there is a risk of inhalation of lead identified by the department to establish:

- the actual level of lead in air concentrations;
- whether the Occupational Exposure Limit has been exceeded;
- whether the work undertaken is likely to result in staff or students being exposed to lead which is classed as “significant”; and
- whether there is a need to place staff or students under medical surveillance.

Upon completion of the monitoring exercise the Occupational Hygienist will provide a written report to the department via Safety Services.

Departments must consider the information they have collected about the use of lead, along with the monitoring results, to determine which work activities present risks to staff or students health, particularly those likely to result in “significant” exposure.
4.3. **Deciding On and Implementing Risk Control Measures**

Departments must in the first instance prevent staff and students being exposed to lead. Therefore consideration must be given to the following options:

- eliminate the use of or production of lead by changing the way the activity is carried or introduce a way of working which prevents staff or students coming into contact with the lead; and
- substituting lead with a lead free alternative.

Where prevention cannot be achieved exposure must be adequately controlled. A good starting point is the recommendation(s) contained in the Occupational Hygiene Monitoring Report. Consideration must also be given to the following remaining hierarchy of measures which may be used individually or collectively:

- use work processes, systems and engineering controls to avoid the generation of lead dust e.g. reduce working temperatures to below 500°C, use a wet method such as wet grinding, using lead in emulsion or paste etc.;
- control exposure at source using adequate ventilation systems e.g. using local exhaust ventilation that prevents the occupational exposure limit being exceeded;
- use appropriate organisational measures such as safe systems of work; and
- provide suitable personal protective equipment (PPE) to supplement other measures listed above. Note: PPE must not be taken home for laundering as the risk of contamination can be passed onto family members.

In addition, there must be adequate washing and changing facilities and places free from lead contamination where staff and students can eat and drink.

Where "significant" exposure is likely then specific risk control measures must be implemented over and above any other action taken to prevent or control exposure as follows:

- provide staff and students with PPE to prevent lead being inhaled, ingested or absorbed. Depending upon the route of entry this may mean provision of gloves, face shields, aprons, respiratory protective equipment (RPE) etc. When selecting RPE it is important to select a product that is suitable e.g. designed to filter out dust, fumes or vapours and at the concentrations likely to be generated as part of the work activity. It is important that users have an appropriate face fit test to ensure the respirator fits correctly and provides a good seal against the contaminant;
- monitor lead-in-air concentrations at least every three months where **significant exposure** arises from lead dust, fume or vapour. The department will need to establish a monitoring programme to ensure all staff and students have their exposure measured and adequate records are maintained; and
- place the staff and students concerned under medical surveillance. This requires a medical surveillance programme to be established with the Occupational Health Service.

Once in receipt of the Occupational Hygiene Monitoring Reports departments must implement any recommendations made.

Consideration must be given to an appropriate and proportionate response where an event causes or threatens to cause a member of staff to be exposed to lead on a scale well beyond that associated with normal day to day activities e.g. sudden or uncontrolled release of lead dust or fume.

4.4. **Recording the Significant Findings**

The significant findings of the risk assessment process must be recorded on the General Risk Assessment Form (S20) and include the following:

- the work activities assessed;
- what form the risk of exposure to lead arises e.g. dust, fume, vapour;
• the route(s) of entry into the body e.g. inhalation, ingestion, absorption;
• who could be affected, including vulnerable groups such as women of reproductive capacity;
• whether a “significant” risk of exposure is likely;
• the results of monitoring for lead in air concentrations conducted by the Occupational Hygienist;
• the control measures already in place or proposed to manage the risk;
• the relevant information, instruction and training provided to or proposed for staff and students;
• where “significant” exposure is likely, the scheme of medical surveillance in use or planned; and
• where necessary additional controls to reduce the risk.

The risk assessment will need to be reviewed if there is any reason to suspect that the original assessment is no longer valid, there has been a significant change in the work to which the assessment relates, the results of any monitoring indicate it should be reviewed or the results of medical surveillance prompt a review. In any case the risk assessment should be reviewed at least every 2 years.

5. **Arranging Medical Surveillance**

Where the risk assessment process has identified that particular staff and students’ exposure to lead is likely to be “significant” then medical surveillance must be organised through the Occupational Health Service. Departments must nominate a person to liaise with the Occupational Health Service to establish a suitable programme of medical surveillance. It is therefore important that the risk assessment clearly identifies the staff/students at risk as this will be used to select which members of staff/students require surveillance.

Medical surveillance comprises of initial and periodic medical assessments which include measuring the staff or student’s blood-lead and/or urinary lead concentration. The purpose of the surveillance programme is to detect early signs of excessive lead absorption or early adverse health effects and to remove staff/students from further exposure to prevent lead poisoning or other health effects developing.

Even where staff or student’s risk of exposure is not classed as “significant”, a copy of the risk assessment should be forwarded to the Occupational Health Service for the Occupational Health Physician to advise whether medical surveillance would be prudent in the circumstances.

Where a surveillance programme is required it will be based on the system as advised by the HSE document ‘Control of Lead at Work Regulations 2002 - Approved Code of Practice and Guidance’. Where surveillance is conducted it is the responsibility of the department to keep health records on the outcome of the medical surveillance and information on the person’s fitness to continue to work with lead. (It should not contain any confidential medical information, which should be kept by Occupational Health Service). Such health records should be kept for 40 years.

When the programme of medical surveillance is completed, the Occupational Health Service will provide the department with an anonymised general report of the results advising whether there are any health issues emerging. Departments must use this information to determine if the current risk control measures are effective or if further action is required.

6. **Providing Information, Instruction, Training and Supervision**

**Information**

Where staff and students are exposed to risks from lead then departments must inform them about:

• the risks to health from lead;
• the significant risks from the risk assessment;
• results of occupational hygiene monitoring;
• how the risks can be controlled; and
• arrangements for medical surveillance, where this is deemed necessary.

This can be imparted during a staff briefing or a tool box talk. It is recommended a copy of or access is given to the online version of the Health and Safety Executive leaflet “Lead and You - (INDG 305 (rev1)).


The Occupational Health Service can assist with staff briefings or tool box talks.
6.1. **Instruction and Training**
Staff and students must be provided with relevant instruction and training on how to use control measures such as local exhaust ventilation, personal protective equipment, respiratory protective equipment etc. correctly. Instruction must also be given on how to maintain the control measure where the member of staff will be expected to carry this out e.g. required maintenance on respiratory protective equipment.

The importance of maintaining good personal hygiene must be stressed e.g. washing hands before leaving the work area and not taking contaminated personal protective equipment or clothing home.

Clear instruction must be given on how to deal with accidents, incidents and any emergencies that may arise from working with lead e.g. failure of the LEV system which may increase the concentration of lead in air above the recommended levels, how to deal with contaminated items following an incident etc.

6.2. **Supervision**
Where there is a risk of exposure to lead, departments must provide adequate supervision to monitor that risk control measures required to eliminate or reduce the risk are being implemented and remain effective.

7. **Further Information and Guidance**

7.1. **HSE Source**
Publications free to download from the Health and Safety Executive website [http://www.hse.gov.uk/](http://www.hse.gov.uk/)

The following summarises how departments can effectively implement this Local Rule and integrate it into its management systems. These processes will be monitored as part of Safety Services’ Audit Programme, and where departments are able to demonstrate fulfilment of key actions, this is likely to provide strong evidence of good practice.

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<th>Key Management Actions</th>
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| **1. Departmental Roles** | • ensure that a responsible person is appointed by the Head of Department to co-ordinate the lead assessment process;  
• ensure that the duties of the nominated co-ordinator are defined;  
• ensure that appropriate management, administrative and technical systems and procedures are in place to effectively control risks from lead and these are regularly reviewed; and  
• ensure that the above systems and procedures are incorporated into general departmental arrangements and communicated to relevant staff. |
| **2. Identifying Hazards** | • ensure work activities involving lead which may present a risk to health are identified. |
| **3. Evaluating Risks** | • ensure relevant information concerning work activities involving lead is gathered;  
• ensure any occupational hygiene monitoring is arrange with Safety Services; and  
• ensure the results of occupational hygiene monitoring are considered when evaluating which work activities and people will be exposed to lead that could damage their health. |
| **4. Implementing Risk Control Measures** | • ensure recommendations in occupational hygiene monitoring reports are implemented;  
• ensure the range of risk control measures available is considered and those measures that will reduce exposure to lead are implemented; and  
• ensure consideration is given to accident, incident and emergency procedures. |
| **5. Recording the Significant Findings** | • ensure records of risk assessments and significant findings for lead are recorded on the S20 Form; and  
• ensure assessment(s) are reviewed at least every 2 years unless other changes occur before this period. |
| **6. Arranging Medical Surveillance** | • where appropriate ensure the risk assessment identifies the need for medical surveillance and a member of staff is appointed to liaise with the Occupational Health Service to implement a medical surveillance programme;  
• ensure the anonymised general report from the Occupational Health Service is considered to determine if the current controls are effective;  
• ensure the relevant staff and students have attended for medical surveillance; and  
• ensure records are kept on results of medical surveillance. |
| **7. Providing Information, Instruction, Training and Supervision** | Where staff and students are exposed to the risk of lead  
• ensure relevant information, instruction, training and supervision about the risks is provided; and  
• ensure a record of the training provided, staff attending and any information issued is retained. |