

WORKING WITH LEAD IN CONSTRUCTION

*– a guide to Health, Safety and
Environmental Care*



LEAD SHEET ASSOCIATION

LEAD SHEET'S GREEN CREDENTIALS

Lead has been viewed over the years as posing a potential risk to health; however, lead sheet used and disposed of correctly does not present a risk to human health. Lead sheet has a very high resistance to atmospheric corrosion, and newly installed lead sheet forms a natural patina or surface protective film that is both strong and adherent. Any minute products of corrosion washed off during the lifetime of a roof become highly diluted in rainwater, and as lead remains inert in both soils and in the beds of watercourses, the combination of correctly designed gutters and drainage systems means that bio-availability within the eco-system is extremely limited. It must also be remembered that lead is a naturally occurring element within the earth's crust, and is one of the easiest metals to recycle.

When environmental and construction sustainability of products is considered for building materials lead sheet has always been ahead of its time with lead sheet used on Roman buildings, medieval cathedrals, and castles being recycled and reused time and time again.

As lead sheet offers a long service life it will not only fulfil the need of the building industry when selecting materials and products, but it can also help the industry to accomplish the growing need to reduce waste materials at the demolition phase, particularly as lead sheet can be so easily recycled avoiding the need for landfill or incineration associated with alternative products. In this sense when the environmental profile of lead sheet is being considered it is no longer a question of a product life cycle being cradle to grave – for lead sheet it is CRADLE TO CRADLE.

LEAD SHEET – THE FACTS... Why it stands out above other products

- Over 95% of lead sheet product reclaimed at the end of the building's life
- All reclaimed lead sheet recycled into new product without loss of performance
- Recycling involves no solvents and supports environmental strategies
- Recycling (due to lead's low melting point) requires low energy requirements and supports the Kyoto protocol
- All by-products created during re-processing are recycled
- Life cycle analysis shows proven superior environmental profile compared with any suggested substitutes
- Substitutes do not provide the same application performance – fit and forget
- Proven longevity of product application over centuries of use
- Full technical product support



WORKING WITH LEAD

A guide to safe working with lead sheet in construction

INTRODUCTION

This booklet is intended as a brief guide, advising on health, safety and environmental procedures for those working with lead sheet in construction. It does not provide a substitute for any legislative guidance documents such as the *Control of Lead at Work Regulations (2002)* nor the related *Approved Code of Practice*.

It is the responsibility of all users of lead sheet whether they are employees or employers to take account of all pieces of legislation including but not limited to the *Control of Substance Hazardous to Health (COSHH) Regulations (1988)*, the *Manual Handling Regulations (1992)* or the *Construction Design and Management (CDM) Regulations (1994)*.

This publication may be used as part of the Health and Safety File under CDM.

ABOUT LEAD SHEET



Used in UK construction for centuries, lead whilst a toxic material, is only harmful if inhaled or ingested. The risk of inhalation arises where lead is being melted, or through breathing in dust particles contaminated with lead. With regard to ingestion, this might occur through poor personal hygiene, when a user does not follow a few simple rules and procedures.

The most commonly known fact about lead is its density or weight and careful handling is therefore required, with larger pieces or rolls weighing more than 25kg only being handled with assistance or the appropriate lifting equipment.

DUTIES OF EMPLOYERS, EMPLOYEES, SUB-CONTRACTORS AND SELF-EMPLOYED PERSONS

The *Control of Lead at Work Regulations* applies to work in which a person is exposed to lead in a form that may be inhaled or ingested.

An employer also has a duty to protect other persons on premises where such work is being carried out or who are liable to be exposed to lead from that work.

An employer must:

- Make every employee and sub-contractor aware of any health and safety risk, which may be encountered
- Advise the correct procedures and precautions to be taken
- Ensure that staff should be competent and adequately trained for their assigned tasks

It is the employees' responsibilities to take due note of any possible risks, follow procedures and take notice of the necessary and simple precautions as advised. A level of competence and training adequate to perform the various tasks is required.

ASSESSMENT OF EXPOSURE

This is a key area, to be considered *before* lead work commences, and reference should be made to the Approved Code of Practice.



The Regulations state that an “employer shall not carry on any work which is liable to expose any employees to lead at work unless he has made a suitable and sufficient assessment of whether the exposure of any employees to lead is liable to be significant.”

If there is a risk of exposure, correct working practices, proper controls and the appropriate safety equipment should all be established and available *before* work proceeds.

SIGNIFICANT OR NOT SIGNIFICANT RISK OF EXPOSURE

The degree of protection required by the Regulations is determined by the Assessment, being either “*Significant Risk of Exposure*” or “*Not Significant Risk of Exposure*” that is the main question.

The Code of Practice provides further information as to the types of work likely to be covered by each category of risk.

If there is *Significant* risk, *Control of Lead at Work* Regulations will apply, including:

- Provision of protective clothing
- Adequacy of washing & changing facilities
- Possible air monitoring requirements
- The need for medical surveillance
- Possible provision of respiratory equipment

If there is *Not Significant* risk, then some elements of the Regulations, including provision of protective clothing, air monitoring and medical surveillance, will not apply.

LEVEL OF RISK AFFECTED BY CONDITIONS

When handling and working with **clean solid lead sheet**, risk of exposure to lead is likely to be “*Not Significant*”.

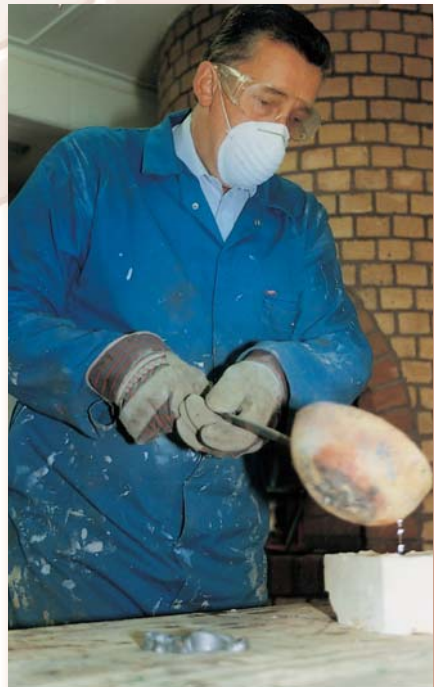
BUT

If stripping existing lead sheet from a roof where the underside may be corroded then dust might be present that could be inhaled. In such cases, the operation could be assessed as being a “Significant” risk of exposure, depending on the state of the lead and the time taken in its removal.

Melting down of lead (e.g. for caulking joints) should be carried out at low temperatures (certainly below 500°C) and can be assessed as “*Not Significant*”.

PROVIDED

The quantities of lead are small and the melting operation is carried out on open site and/or in a well-ventilated area.





LEAD WELDING

At temperatures above 500°C lead begins to fume and the risk of inhalation could increase substantially. In most on-site building applications lead welding is carried out only for short periods and in open-air conditions and therefore exposure to fume is likely to be “Not Significant”.

***HOWEVER** If lead welding in restrictive conditions such as a confined space or for lengthy periods the risk of exposure may be assessed as “Significant”.*

Furthermore, within a workshop area lead-in-air measurements should be taken and monitored to assess exposure, as air movement will be more restricted and exposure times longer.

Lead-in-Air standard measurement is a time-weighted average. Refer to the Approved Code of Practice.



CONTROL MEASURES

The employer and employee must ensure, as far as is reasonably practical that all measures are taken to restrict and control exposure and that respiratory equipment, protective clothing, etc are

- Properly used and maintained in an efficient state
- Are in an efficient working order and
- Provided in adequate supply (particularly on remote sites)

LEGISLATION

The Control of Lead at Work (CLAW) regulations sets out the permissible levels of Lead in Blood. The current permissible levels as at the time of publication are:-

- Women of reproductive capacity 30ug/dl (action level 25ug/dl)
- Young persons 50ug/dl (action level 40ug/dl)
- Any other employee 60ug/dl (action level 50ug/dl)

In order to meet these limits “action levels” (as shown above) have been built into the legislation whereby employers are required to take appropriate action and measures in order to reduce the exposure. Copies of the regulations “Control of Lead at Work: Approved Code of Practice and Guidance (COP2) (Third Edition L132) can be obtained from HSE books Tel: 0870 600 5522; Fax: 0870 600 5533; Web: www.tso.co.uk.

RESPIRATORY EQUIPMENT, VENTILATION AND PROTECTIVE CLOTHING

Exposure to airborne lead, fume or contaminated dust requires suitable masks or respiratory equipment to be provided and used. Masks may not be necessary when lead welding in a workshop environment if there is adequate mechanical ventilation at the point where the welding is taking place.

Melting clean scrap sheet in a workshop, or other internal environment for casting should be carried out in a properly ventilated area with good fume extraction. Even then, the initial exposure risk assessment may be “*Significant*” and additional forced extraction equipment may be required to reduce exposure to a “*Not Significant*” level.

NB Melting of lead should be carried out at temperatures below 500°C to avoid fume. Respiratory masks and equipment should be HSE approved.

Each employee should be provided with and should wear adequate protective clothing. This however may not be necessary when the exposure risk is assessed as “*Not Significant*”.

WASHING and CHANGING FACILITIES

Adequate washing facilities should be provided preferably to include barrier cream and nail brushes to assist proper hand cleaning.

Washing (of hands in particular) is essential before eating, drinking or smoking and before leaving the workplace. Hands and arms should be washed thoroughly, with particular attention to scrubbing under the nails.

Changing facilities and a storage area for clean clothes should be available for those employees provided with protective clothing. Employees should remove working clothes, overalls, gloves etc, before washing.

EATING, DRINKING and SMOKING



These have the potential to increase the risk of lead ingestion and inhalation. Employers should make suitable arrangements for employees to eat, drink or smoke in a separate area not liable to be contaminated by lead. Food and drink should not be consumed in any area where lead work is being carried out.

Employees should not smoke when working with lead. Lead contamination is transferred to the cigarette from the fingers and then to the mouth; this risk is further increased with hand-rolled cigarettes and pipe smoking.

Similarly the habit of chewing fingernails must be avoided.

CLEANING

A clean working environment should be established and maintained, including:

- Working areas
- Clean premises
- Vehicle passenger areas
- Respiratory protective equipment
- Work wear protective clothing

Particularly with regard to workshops, dust should be swept up carefully with a soft broom or industrial vacuum cleaner. Applying a fine water spray on very dusty areas will assist in reducing the dust becoming airborne.

Protective clothing and towels should preferably be cleaned on the premises where lead work is being carried out. If this is not possible and/or outside agencies are used for cleaning, employers should ensure all persons likely to handle contaminated clothing for laundry should be alerted to the nature of the contamination and extent of the risk if necessary.

Protective clothing or equipment should not be taken home by employees for cleaning

PREVENTION of CONTAMINATION

Both employer and employee should take such steps as are reasonably practicable to prevent lead contamination spreading beyond the workplace or storage area.

Employer and employee have a duty to protect any other person liable to be exposed to contamination on the premises where lead work is being carried out.

LEAD IN AIR

Where the degree of exposure is assessed as “*Significant*”, it might be necessary to measure and monitor the concentrations of lead-in-air.

MEDICAL SURVEILLANCE

Where the degree of exposure is assessed as “*Significant*”, each employee is required to be provided with medical surveillance, including regular lead-in-blood monitoring. “*Not Significant*” exposure of an on-going or regular nature may also require an employee’s blood lead level to be monitored.

PATINATION OIL

Consult the manufacturers’ guidance leaflet on the safe use of Patination Oil. Normally protection for the skin and eyes should be provided and used, with adequate precautions also taken against the risk of fire.

RECOVERY and RECYCLING OF SCRAP AND WASTE

Lead sheet has one of the highest recycling rates of all non-ferrous metals used in building and construction. Research has shown that the level of recycling is between 90 – 95% and by recycling at these rates it avoids the material being sent to landfill sites reducing potential environmental burdens. In addition, as the metal melts at low temperatures recycling provides an effective method of providing a raw material that can be converted to new products with minimal energy requirements. Off cuts generated during the fitting of lead sheet should be collected in suitable containers and then sold to scrap metal merchants. Similarly, when removing old lead sheet during building refurbishment work the lead should be collected and stacked either in containers or on pallets and then sold to scrap metal merchants. The following list provides a simple code of practice to follow with regard to both off cut retrieval and old lead sheet recovered from building and construction work:-

- Ensure that all your lead waste is segregated from other materials.
- Recognise that separating and collecting redundant lead sheet has both an environmental and financial benefit.
- Ensure that sufficient time has been allowed to strip the building of old lead sheet before refurbishment or building work commences.
- Allocate suitable areas and containers for the storage of scrap lead.
- Off cuts from fixing lead can be saved and used to make clips, lead wedges and other items to assist with the fixing requirements of new lead sheet installations.
- Scrap lead should not be conveyed in an open-backed vehicle unless adequately covered.
- Scrap and dust should be taken to approved scrap metal merchants to facilitate the initial stages of the recycling process.
- Vehicles transporting scrap and dust should be thoroughly washed and cleaned after use.



Note that old lead sheet being replaced must be removed with care. A white dust sometimes gathers on the underside and could be hazardous when disturbed. A fine dust mask should be provided and worn by all persons in the vicinity of such material when it is moved *not just those concerned with its removal*.

If possible, the dust should be removed with an industrial vacuum cleaner, placed in sealed bags or containers, and appropriately marked. The scrap sheet should ideally be placed in covered containers before being loaded onto transport for removal.

LIFTING LEAD



Lead is heavy

Due to the density of the material, even the smallest rolls are unusually heavy, to an extent completely disproportionate to their size.

Proper lifting equipment and additional staff should be available and always used to ensure the safety of operatives and to fulfil the requirements of the “Manual Handling Operations Regulations 1992”, in lifting weights of more than 25kg.

MAINTENANCE OF RECORDS

It is the duty of the employer to provide and maintain adequate records, which show details of:

- The work activity and location of lead work
- The information, training and instruction given
- Assessment of level of exposure to risk
- Precautionary measures and control procedures
- Equipment provided for safe working
- Details of in-situ “hot working” where permitted
- Respiratory equipment supplied and details of use
- Mechanical ventilation provided for workshops
- Personal protective clothing and washing facilities provided
- Lead-in-air monitoring where required
- Medical surveillance where required
- Blood lead levels where required
- Health and safety data sheets on hazardous materials (COSHH)

An entry in the records must be retained for TWO YEARS from the date on which the entry was made.

FURTHER INFORMATION

More information is available through your works safety representative or direct from the local office of the Health and Safety Executive or from The Stationery Office.

HSE Publications

Control of Lead at Work: Approved Code of Practice, Regulations and Guidance (COP2)
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