

Risk Assessment: Maintenance of High-Temperature Furnaces

Hazard	Who Might be Harmed and How?	Existing Control Measures	Further Actions Required	Responsible Person	Date
Burns	<p><i>Staff involved in the maintenance of high-temperature furnaces.</i></p> <p>Direct contact with furnaces or samples at high temperature could result in severe burns.</p>	Staff involved in maintenance operations should ensure furnace has cooled to room temperature before commencing maintenance work.	No further actions required at present, but risk assessment subject to regular review.	N.A.	N.A.

Hazard	Who Might be Harmed and How?	Existing Control Measures	Further Actions Required	Responsible Person	Date
<p>Exposure to refractory ceramic fibres (RCF) and respirable crystalline silica</p>	<p><i>Personnel conducting furnace maintenance</i></p> <p>Replacement of furnace elements / thermocouples, cleaning and repair operations have the potential to generate dust containing refractory ceramic fibres / respirable crystalline silica.</p> <p>RCFs are classified as carcinogens and inhalation of dust containing RCFs has the potential to cause serious, long-term health effects. In addition, respirable crystalline silica may form as RCF devitrifies after prolonged heating at high temperature and exposure could lead to silicosis.</p> <p>The long-term exposure limit for RCF is 5 mg/m³ of total inhalable dust and 0.3 fibre/millilitre.</p> <p>The long-term exposure limit for respirable crystalline silica is 0.1 mg/m³</p>	<p>Maintenance operations are only carried out by trained individuals who are cognisant of the hazards associated with RCF fibres and respirable crystalline silica.</p> <p>Standard operating procedures outline how maintenance / repair operations are to be performed.</p> <p>Routine maintenance operations are typically short-term tasks (~1 hour) that produce relatively small amounts of dust helping to reduce overall exposure.</p> <p>Individuals carrying out maintenance operations wear appropriate PPE including FFP3 masks, safety glasses and disposable gloves and aprons. With PPE in place, exposure should be controlled well below the workplace exposure limits.</p> <p>Wetted paper towels are used when cleaning surfaces to reduce airborne dust.</p> <p>In the event a furnace requires decontamination prior to maintenance, a dedicated “M-class” vacuum cleaner for RCF/RCS material, equipped with HEPA-filter, is used to minimise the amount of</p>	<p>Investigate the introduction of a portable LEV system / vacuum cleaner modification to further reduce the amount of airborne dust generated during the maintenance activity.</p>	<p>Kevin Jones</p>	<p>Reach decision regarding LEV system by June 2026.</p>

		<p>dust generated and prevent dust becoming airborne.</p> <p>Waste material that contains refractory ceramic fibres and/or respirable crystalline silica will be placed in sealed bags / containers and removed by an external contractor.</p>			
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Electrical Shocks	<p><i>Personnel working with furnaces and carrying out maintenance operations.</i></p> <p>Direct contact with live electrical components during maintenance could result in electrical shocks.</p> <p>Touching tongs to elements when adding / removing samples could result in an electrical shock if element is live.</p>	<p>Furnaces are regularly inspected to ensure good working order. If damaged cables are identified, equipment will be isolated and not used until repairs are completed.</p> <p>Repairs are carried out by a competent electrician trained in the</p> <p>Safe system of work for maintenance tasks outlines furnace must be disconnected from mains supply before work commences.</p> <p>If a furnace is hardwired to an electrical connection (i.e. appliance is not simply connected to a mains electrical supply), an Estates electrician must isolate electrical power or physically disconnect before any maintenance work is carried out.</p>	No further actions required at present, but risk assessment subject to regular review.	N.A.	N.A.

Assessment Carried out by: Dr Kevin Jones

Date of Assessment: 27/06/2025

Date of Next Review: 27/06/2026

		Furnaces are equipped with interlocks; furnace elements are not live when furnace doors are open, eliminating the risk of shock.			
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Safe systems of work covering maintenance of high-temperatures furnaces as well as cleaning of high temperature furnaces can be found at the following web addresses: <https://chemhands.wp.st-andrews.ac.uk/safe-systems-of-work/>

Training Requirements:

Workers performing electrical maintenance operations on furnaces will need to be competent to work with electrical systems (e.g. qualified electrician). A suitably qualified person will require training to work with electrical items.

Any worker involved in the replacement of elements / thermocouples will require training in the hazards associated with RCF materials and the use of PPE.

Specialised Emergency Response (if required):

In the event a member of staff suffers an electric shock during maintenance operations, the injured party should stop work and leave the immediate work area, remove any contaminated items of PPE and place in the assigned waste container and inform a departmental First Aider who can provide further assistance.

In the event a staff member involved in maintenance operations suspects they have been exposed to harmful dust / fibres, they should stop work, leave the immediate work area, remove any contaminated items of PPE and place in the assigned waste container and inform a departmental First Aider who can provide further assistance.

Version Control:

Version Number	Purpose or Changes	Document Status	Author of Changes, Role and School/ Unit	Date
1.0	Original Document	Published	Kevin Jones, Chemistry	27/06/2025
1.1	Updated document with emergency response and training section	Published	Kevin Jones, Chemistry	27/10/2025
1.2	Updated to reference M-class vacuum cleaner	Published	Kevin Jones, Chemistry	08/02/2026