**Manchester Institute of Biotechnology - Risk Assessment Form**



| **Date:** January 2015 | **Assessed by**: Dave Charlesworth | **Validated by**: Tanya Aspinall | **Location**: MIB  |  | **Review date:** 2016 |
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| **Task**  Use of Autoclaves and Sterilisation Equipment  |

| **Activity**  | **Hazard**  | **Who can be harmed and how?**  | **Existing measures to control risk**  | **Risk rating**  | **Result**  |
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| Material Preparation and loading autoclave  | Glassware, sharps, hazardous substances  | User cuts, exposure to hazardous substances  | Ensure that steam can enter all vessels (bags to be loosely sealed, bottle tops to be loosened). Do not over-fill bottles with liquid, allow for expansion.Loose dry materials must be wrapped or bagged in steam-penetrating paper or loosely covered with aluminium foil. Wrapping too tightly will impede steam penetration, Loosen all lids to prevent pressure build up. All containers must be covered by a loosened lid or steam-penetrating bung.Containers of liquid must not exceed two-thirds (2/3) full and the lids must be loosened.Glassware should be heat-resistant borosilicate. Check the glass is not chipped or cracked before autoclaving Plastics must be heat-resistant, i.e., polycarbonate (PC), PTFE (“Teflon”) and most polypropylene (PP) items.All items to be tagged with autoclave tape.Do not load a hot autoclave Do not overload; leave enough room for steam circulation. Never autoclave flammables or other substance’s likely to give off hazardous vapour Check steam valve is functional and close and latch door firmly. | Low | A |
| Use of autoclave and sterilisation equipment | Burns from steam, hot metal, hot liquids, glassware | Staff and service engineers, plus those in close vicinity; autoclave failure and explosion , steam burns, scalding fluid burns, damage to eyes,exposure to hazardous substance  | Autoclaves and sterilisers must meet minimum British standards, be placed in a suitable location (Bench top autoclaves: - place centrally on level bench) and be on an annual maintenance, inspection and validation schedule.All users must be fully trained in the usage of this equipment and be aware of the manufacturer’s instructions for loading maintenance, autoclaves, checking water levels and pressure gauges. All users should be aware of how to treat scalds.Floor standing and integral autoclaves:-follow correct sequence for closing knobs on chamber doorBench top autoclaves: – place centrally on level bench, ensure safety valves are workingOnce sterilisation cycle is complete, allow pressure to normalise before opening, follow correct sequence of opening knobs.The following items of PPE must be worn when using/unloading an autoclave: Howie-style laboratory coat, BS EN 407 compliant thermal gloves and BS EN166 compliant eye protection (chemical splash proof safety glasses). A selection of safety glasses and goggles are available from MIB Stores; users are advised to visit Stores and select eye protection which fits well and is comfortable to use. Regular lab inspections monitor the wearing of PPE; users found not to be wearing PPE when the risk assessment states that it must be worn will be subject to the MIB compliance policy. | low | A |
| Unloading the autoclave  | High temperatures,steam, scalding fluids, hot glassware , metal, hazardous substances  | Users and those in the vicinity, steam burns, scalding fluid burns, damage to eyes,exposure to hazardous substance  | Ensure that the cycle has completed and both temperature and pressure have returned to a safe range.Carefully open door no more than 1 inch. This will release residual steam and allow pressure within liquids and containers to normalize. Follow correct sequence of opening knobs. Allow the autoclaved load to stand for 10 minutes in the chamber. This will allow steam to clear and trapped air to escape from hot liquids.Do not agitate containers of super-heated liquids or remove caps before unloading.Wearing heat-insulated gloves (BS EN 407 compliant) remove items from the autoclave and place them in an area which clearly indicates the items are ‘hot’ until the items cool to room temperature. Shut autoclave door.Note: Allow autoclaved materials to cool to room temperature before transporting. Never transport superheated materials.Should any spillages occur, wait for autoclave to cool down and use suitable cleaning materials  | Low | A |
| Use of an Autoclave | Electricity  | Contact with faulty or damaged electrical equipment could cause burns, electric shock  | All autoclaves are inspected annually (high pressure equipment) – organised by MIB Safety Advisor; users undertake regular visual inspections, and report any problems by email to mib-problem@listserv.manchester.ac.uk. PAT testing on smaller portable autoclaves |  |  |
|  | Manual handling – carrying and lifting items into autoclaves, etc. | Staff-could suffer damage to back if heavy/bulky items are incorrectly handled | Dedicated technical staff trained in correct manual handling techniques.Trolley used to transport heavy items. | low | A |

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| **Authorisation by PI** **I confirm that I have considered and understand the experiment and the associated hazards. I am satisfied that all of the hazards have been identified and that the control measures to be followed will reduce the risks to acceptable levels.** **Print name: Signed:****Date:** |

**Declaration by researcher**

**I confirm that I have read this Risk Assessment and that I understand the hazards and risks involved and will follow all of the safety procedures stated. Where PPE has been identified as a control measure, I will ensure that it is worn.**

**Declaration by PI**

**I confirm that the researcher who has signed below is competent to undertake the work. My counter-signature indicates that I am happy for the work to proceed.**

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| **Name (please print)** | **signed** | **PI countersignature** | **date** |
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