

FIRE SAFETY GUIDE FOR THE OPERATION OF UNATTENDED MACHINERY



This document is designed to assist NFU Mutual customers in managing the fire risks associated with unattended machinery/processes in operation



NFU Mutual
RISK MANAGEMENT SERVICES

INTRODUCTION

Reductions in staff numbers and ongoing developments in automation to maximise output, have led to an increasing number of processes continuing outside business hours, with machinery operating for longer periods of time and doing so unattended. Often such machinery and processes involve or generate heat and prolonged use can present a potential ignition hazard.

Where the use of unattended machinery cannot be avoided, steps must be taken to minimise the risk of fire and such steps should be overseen by a designated person or team.

These guidelines are not intended to cover office equipment or essential services within buildings (Building Management systems).

FIRE RISK ASSESSMENT

A fire risk assessment to be undertaken to identify and evaluate the potential for a serious fire at your premises. Responsibility for the fire risk assessment rests with occupiers and owners of business premises and to include: the construction of the premises, working practices within, fire inception hazards, likely fire spread potential and the suitability and standard of fire protections including your fire alarm, fire doors, emergency lighting, escape

signage and fire extinguishing appliances. The risk assessment to be carried out by a suitably competent person and any necessary control measures carried out to reduce the risk and effects of fire.

We recommend the local Fire & Rescue Service are invited to visit the premises to assess the water sources and familiarise themselves with the layout and the location of the premises.

SITING OF MACHINERY

Machinery to be located in a separate compartment constructed of incombustible materials and designed in accordance with Loss Prevention Council (LPC) 'Recommendations for Fire Protection of Buildings'.

Where this is not practical, machinery to be sited within an area free from obstruction and combustible materials.

Any combustible construction within 3m of the machinery to be boarded over with incombustible material to provide at least 60 minutes fire resistance. Care to be taken to ensure that piped services, ducts and cables passing through the walls, floors and ceilings of the compartment are suitably fire stopped to the same standard as the fire rating of the building envelope.

MACHINERY/MAINTENANCE

Machinery to be used and operated in accordance with the manufacturer's instructions. Machinery to be serviced in accordance with manufacturer's recommendations, or at least annually, whichever is the most frequent, by a competent person. The service inspection

to include all safety devices associated with the machinery such as: thermostats, thermocouples and float switches and calibration checks to be undertaken and maintained in accordance with the manufacturer/installer's recommendations.

TRAINING

Employees using the machinery to be fully trained in the machine's safe use and aware of all safety features. Such training

to be documented and reviewed, at least annually or should there be any changes to its operation or usage.

SAFETY FEATURES

All primary safety features to have a secondary independent safety cut out device and where auto-timers are used they should

be restricted, wherever practical, to minimum periods only after normal premises occupancy times.

ELECTRICAL INSTALLATION

All fixed wiring systems to machines to be connected to an independent isolator or junction box fitted with an independent and suitably rated Residual Circuit Device (RCD).

An annual test to be undertaken on the machinery and fixed wiring system connecting the machinery to the main electrical distribution board.

Consider annual thermographic inspections, by a competent person, of the machinery and fixed wiring systems. Any remedial action identified to be undertaken without delay following the inspection.

The Electrical installation must be tested in accordance with the current edition of Institute of Electrical Engineers (IEE) Wiring Regulations: **BS7671 Requirements for Electrical Installations IET Wiring Regulations**. All tests to be undertaken by an approved National Inspection Council for Electrical Installation Contracting (NICEIC) electrical engineer or similar United Kingdom Accreditation Services (UKAS) accredited body.

Further guidance can be found in the Fire Safety Guide for Electrical Installations.

HOUSEKEEPING

Combustible and hazardous materials to be kept to a minimum and a clear space of at least 1.5m maintained around the machinery when left operating and unattended.

Flammable liquids to be kept to a minimum and not exceed 50L and to be stored within a

proprietary metal container. Storage to be in accordance with **RISC Authority Guidance Note RC55: Recommendations for fire safety in the storage, handling and use of flammable and highly flammable liquids.**

AUTOMATIC FIRE SUPPRESSION

Consider installation of an LPCB approved automatic fire suppression system to the equipment to comply with **LPS1666: Requirements and test procedures for the LPCB approval of direct low pressure (DLP) application fixed fire suppression systems** and upon activation isolate the

power supply and activate the fire alarm system via a relay switch.

Further guidance can be found at www.redbooklive.com/download/pdf/LPS1666-Issue-Direct-Low-Pressure-Application-Fire-Suppression-System-Standard.pdf

AUTOMATIC SPRINKLER PROTECTION

Consider the installation of automatic fire sprinkler protection to reduce the risk of fire growth and spread in the event of ignition. Any new sprinkler system to be designed

and installed in accordance with LPC rules **BS EN12845: Fixed Fire Fighting Systems Automatic Sprinkler Installations.**

FIRE DETECTION

Many accidental fires start when the premises are unoccupied. This means any faults or issues that could give rise to a fire are not detected quickly after ignition, with the potential for rapid growth.

Consider installation of, or upgrading existing system, to an automatic fire alarm system conforming to **BS5839: Fire Detection and Alarm Systems for Buildings: Part 1: Code of Practice for Design installation,**

commissioning and maintenance of systems in non-domestic premises, specifically designed to provide early warning fire detection. The fire alarm system to also give a warning remotely to nominated staff via an approved alarm receiving centre.

A programme of testing, servicing, checking and maintenance in accordance with the installer's recommendations to be in place and documented.

PORTABLE FIRE EXTINGUISHERS

Suitable portable fire extinguishing appliances to be located throughout the premises, with at least one dry powder appliance located within the vicinity of the machines. Regular inspection and

maintenance to be undertaken and recorded by an approved supplier. Staff to be provided with instruction and training in the correct use of extinguishers.

BUSINESS CONTINUITY

Even a small fire can have a disproportionate effect on a business if it occurs in a critical piece of equipment/machinery. All businesses should therefore take steps to ensure the continued smooth

running of the business by making a suitable emergency plan and carrying out a business impact analysis which can form the basis of a continuity plan to be put into place in the event of a loss.

ADDITIONAL CONSIDERATIONS FOR SPECIFIC TYPES OF MACHINERY

FORK-LIFT TRUCK CHARGING

Battery charging to be undertaken in an area of non-combustible construction or outside the main buildings. Where this is not possible charging is not to be undertaken within 3 metres of combustible composite insulated panels unless they are protected by non-combustible materials such as steel checker plate or mineral board extending at least 1.5 metres around the chargers.

Chargers not to be mounted on to panels but on fixed metal stands located at least 250mm from the panels.

Further guidance can be found in the Fire Safety Guide for Fork Lift Trucks

ELECTRICAL DISCHARGE MACHINES (EDM) e.g. SPARK EROSION MACHINERY

EDM should not be left operating unattended overnight however where this is not possible

strict management controls, in accordance with RISC Authority Guidance Note **RC29 - Recommendations for Spark Erosion Machining** to be introduced together with additional safety measures to include (in addition to the above general comments):

1. A clear space of at least 3m to be maintained around the machinery;
2. Only recommended dielectric fluids approved by the manufacturers with a high flash point (approximately 140 degree Celsius) to be used;
3. A float switch, designed to switch the machine off at low fluid level, to be fitted within the tank or incorporated into the weir system to ensure there is sufficient depth of fluid to cover the gap between the upper electrode and the work piece. At least 40mm depth of fluid cover is recommended;

4. A back-off limiting switch to be incorporated and set to isolate the machine should the electrode move upwards. The recommended pre-set distance is 8mm but under no circumstances should the electrode reach the surface of the liquid;
5. A thermostat to be included to measure the temperature of the dielectric fluid and shut the machine down before a dangerous condition arises. The thermostat to be set to isolate the machine at least 10° below the normal flash point of the fluid;
6. An anti-arc device to be incorporated into the electronic controls measuring the spark frequency and gap voltage. The device to be pre-set to back off should the spark gap be bridged;
7. Consider a fixed start point monitoring device to shut the machine down should the electrode retract above the point at which the machinery operation started. This to operate independently of a back off switch.

ELECTROPLATING, HEAT TREATMENT AND PRODUCTION TYPE BAKING EQUIPMENT

Where such machinery is utilised strict management controls to be introduced

together with additional safety inspections and safety devices to include:

1. Temperature controls and/or low level cut out devices as appropriate to be fitted to the machinery in accordance with the manufacturer's instructions;
2. All primary safety features to have a secondary independent safety cut out device. Where secondary temperature thermostats are utilised the thermostat to be set to isolate the machine at 20° above normal operating temperatures;
3. Electrical safety checks in accordance with the electrical installation paragraph above to be undertaken and to include annual testing for earth leakage and voltage checks;
4. Any combustible construction within 3m of the machinery to be boarded over with incombustible material of at least 60 minutes fire resistance;
5. Where ovens are used for pre-heating plastic components, a metal catchment tray (in addition to the above safety devices) to be provided. The tray to have sufficient capacity to contain the volume of components within the oven.

FURTHER GUIDANCE

RISC Authority are a funded research scheme supported by a significant group of UK insurers and conducts research in support of the developments and dissemination of best practice on the protection of property and business. Guidance document RC29

- Recommendations for Spark Erosion Machining and A Guide to Incident Management and Business Continuity for Small Businesses with accompanying template are available at www.riscauthority.co.uk

IMPORTANT NOTE:

The information contained herein is designed for guidance only and NFU Mutual cannot accept responsibility for any errors or omissions arising from its use. Should further guidance be required please contact our local NFU Mutual Regional or Branch office, or telephone Risk Management Services on 01789 202425.



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