Manufacturing risks

Practical risk management advice for small and midsize manufacturing businesses

Take a look ›

While Manufacturing comprises just **5% of the UK's businesses, it accounts for 10% of employment and 14% of turnover.** Of the 270,000 firms that make up this diverse sector, just over half (138,050) are micro and SME manufacturers.

While each manufacturing site has a unique risk profile, firms like yours are exposed to a common set of risks. Understanding these risks can help you identify areas of your business that are most susceptible to the types of claims typically made by manufacturers, so **we've created this guide to help you safeguard your business, employees, contractors and site visitors.**

Common risks covered in this guide

Moving machinery

Machinery can create safer working conditions by automating dangerous, repetitive tasks, but human error and inadequate maintenance or training can put workers at risk of injury or death. According to RIDDOR accident statistics published by the HSE in 2021, 4% of non-fatal injuries and 9% of fatal injuries to workers in Great Britain were caused by contact with moving machinery. These incidents can be minimised or eliminated by installing machine guards, which are designed to prevent body parts or clothing from being pulled into machinery, or operators being struck by ejected materials. Machinery should be regularly maintained, and formal training and appropriate Personal Protective Equipment should be provided to those operating machinery in your workplace.

External storage and arson

Arson accounts for just over half of all fires attended by Fire & Rescue Services across the whole of the UK. Most arson attacks are unplanned, opportunistic crimes, but there are simple steps you can take to improve your security and fire safety precautions to protect your people and premises.

Housekeeping

Poor housekeeping practices, both indoors and outdoors, greatly increase the risk of fires due to the presence of unwanted fuels close to potential sources of ignition. Poor housekeeping also creates hazards that can lead to, for example, slips, trips and falls or being struck by falling objects.

Hot works

Hot work is defined as any operation that involves open flames or produces heat or sparks, such as cutting, grinding, brazing and soldering. All hot work processes have the potential to create serious fire risk, and can expose workers – whether employees or contractors – to hazardous fumes and gases that can result in severe health and safety impacts, therefore effective control measures are required.

Forklift trucks

Forklift trucks are among the most hazardous vehicle types in the workplace, often found in warehouses, workshops and factories. As with most heavy machinery, these vehicles pose risks to employees, contractors and visitors, and incidents involving them are usually serious and often fatal. Forklift trucks powered by diesel, LPG or battery each present specific fire hazards associated with both the equipment itself and the environment in which it operates.

Electrical safety

Industrial and factory environments pose many electrical hazards, such as improperly installed and maintained equipment, exposed wires or unlocked electrical panels. Introducing electrical safety practices, standards and requirements will help to mitigate these risks to employees and reduce the likelihood and severity of damage to other assets.

Moving machinery

Did you know…?

of injuries in manufacturing are caused by contact with moving machinery.[1]

Find out more...

HSE guide to providing and using work equipment safely

HSE guide to the safe isolation of plant and equipment

[1] Source: HSE

Dos and don’ts

- Do conduct risk assessments in front of the machines in question and involve employees who operate them
- Do use fixed guards (rather than adjustable, self-adjusting or interlocking guards) wherever possible
- Do check that guards are properly installed each time before commencing work
- Do neutralise and lock out all power sources for the machine before removing guards for maintenance, repair or adjustment, all power sources for the machine
- Do use relevant PPE when operating any machinery
- Don’t start machinery without the machine guards in place (if the guard is missing or not working properly, workers should cease operation immediately and contact a supervisor). Ideally machinery should be interlocked so it can’t start with the guard missing
- Don’t allow workers to bypass, adjust, remove, or tamper with machine guards. Spare interlocks should be securely stored and only issued under strict control to avoid being able to circumvent the guarding
- Don’t allow anyone to use machinery unless they have been trained and certified to operate the particular machine
- Don’t leave machines unattended while parts are still moving
- Don’t wear loose clothing, jewellery, or long hair around machines, which is at risk of being caught in the machinery

Planning ahead

- Risk assessments must be completed by competent persons covering the hazards related to each machine’s moving parts (such as crushing, severing, shearing, entanglement) and the likelihood of any of these occurring. The risk assessment should cover not only normal operations, but also cleaning, maintenance and fault diagnosis procedures
- If there is any risk of an employee coming into direct contact with moving parts, flying chips or being splashed by harmful liquids, install appropriate guarding
- Design a Safe System of Work for operating and maintaining the machine. Maintenance may require the inspection of critical features where deterioration would cause a risk
- Machine guard and safety training needs to be conducted for all machine operators. It is not enough to install machine guards – businesses must also ensure employees receive training on the particular hazard(s) associated with the machine, how guards work, and what to do if a safety guard is damaged, missing or unable to provide adequate protection
- Conduct machinery maintenance and safety audits to ensure safety guards and other safety devices are operating correctly, are free from damage, have not been tampered with and are being used by operators. The audits should be documented and logged. These need to be undertaken daily or before use if intermittently used.

External storage and arson

Did you know...?

Since 2014/15, arson has increased by 15%.

of fires, it is the largest single cause of fire attended by Fire & Rescue services.[2]

Find out more...

RC48 Arson Prevention Guide

RSA Risk Control Guide: Leading causes of fire loss

[2] Source: National Fire Chiefs Council

Dos and don’ts

- Do designated an area for rubbish bins and skips which is at least 10 metres away from buildings and boundaries where possible, if this is not possible then maximise the distance away from the building and do not store under eves
- Do purchase metal bins with lockable lids to hold rubbish, and chain wheeled bins to a fixed post
- Do ensure the perimeter of the building is clear of combustibles
- Do ensure you have an adequate fire detection and alarm systems
- Do prevent access to your buildings via drainpipes, flat roofs and fencing
- Do install lighting that illuminates the entire site externally, preferably vandal-resistant security lights. If necessary, install CCTV in areas which are hidden from view and cut back vegetation close to recesses which could provide cover for an arsonist
- Do consider fitting a metal container on the inside of your letterbox if your establishment has one. Should any lit materials be posted through the letterbox, this will contain the fire, limiting the damage
- Do report accumulated or abandoned refuse to your local council
- Don’t leave unsecured any substances that could be used as an accelerant
- Don’t allow carelessly discarded smoking materials to come into contact with combustible materials – use no smoking signs and strictly prohibit smoking in risk areas

Plan ahead and follow up

- Make staff aware of the procedures required at the end of each period of working to ensure that the premises are secure, that there are no unauthorised persons remaining in the buildings, that all equipment has been shut down safely and that any alarm is set
- During fire raining sessions, educate employees on the hazards of arson and measures that should be taken to prevent incidents. Training should include procedures for reporting anti-social, suspicious behaviour and/or graffiti appearing in the local area
- Complete an arson risk assessment as part of the fire risk assessment procedure required by the Regulatory Reform (Fire Safety) Order 2005
- Conduct regular checks to ensure that fire extinguishers are in their correct positions and are appropriately maintained

Housekeeping

Did you know…?

The majority of all work accidents are caused during the handling of goods or materials, and by people falling, being hit by falling objects, or striking against objects in the workplace. All these causes can be reduced by good housekeeping practices.

Find out more...

Causes and prevention - Slips and trips – HSE

RCG002 – Fire Safety Inspections Risk Control Guide

Dos and don’ts

- Do conduct periodic, documented walkthrough inspections to help identify poor housekeeping hazards
- Do make sure that floors are in good condition, clean, free of oil and grease, and clear of waste
- Do keep aisles, stairways, fire exit routes and fire-fighting equipment free from obstruction
- Do clean machinery and equipment and the surrounding areas so they are free of rags, waste and there is no dripping of oil or grease
- Do make sure work stations are well-organised, clean, clear of debris and that no trip hazards are present
- Do mark unexpected changes in floor level, such as slopes and steps, with high-visibility tape or paint
- Do clear up spillages immediately and ensure cleaning is carried out thoroughly using the correct products and equipment
- Do regularly inspect tools and machinery for wear or leaks
- Do keep tool rooms and racks in a clean and orderly condition
- Do store flammable liquids in proprietary flammable cabinets (or in a dedicated flammable storage room in case of high volume) when not in use
- Do make sure stored materials are properly stacked and spaced
- Do provide metal lidded containers for oily rags and similar waste
- Do remove any combustible waste from the building daily
- Do provide first-aid facilities, and make sure equipment is fully stocked and in clean condition
- Don’t allow waste containers to overflow
- Don’t trail electric leads or air lines across aisle
- Don’t store combustible materials, waste, flammable liquids or gas bottles against buildings. Combustible materials and waste (including idle pallets) should be stored at least 10 metres where possible from any buildings or outdoor equipment
- Don’t store combustible materials in boiler rooms, mechanical rooms or electrical equipment rooms, or next to ignition sources such as electrical distribution boards and battery chargers
- Don’t keep broken or damaged items in the workplace – these must be fixed, replaced or disposed of as soon as possible

Plan ahead and follow up

Good housekeeping involves every phase of manufacturing operations and should apply throughout the entire premises, indoors and out. It is more than mere cleanliness: it requires orderly conditions, the avoidance of congestion, and attention to such details as an orderly layout of the whole workplace, the marking of aisles, adequate storage arrangements, and suitable provision for cleaning and maintenance. Poor housekeeping can frequently contribute to accidents and incidents by concealing hazards that can cause injuries or damage.

A sound method to ensure that housekeeping is done is to prepare a checklist to suit the requirements of the workplace and introduce a daily/weekly housekeeping audit procedure. Once this has been developed, inform and train staff on the procedures.

Over time, your premises will get dirty, and dust and grime will build up on equipment which can adversely affect productivity or cause a fire risk. Schedule a regular date for a deep-clean of your premises before it reaches this point. In between scheduled deep-cleans, instruct your staff to perform a regular housekeeping routine to keep on top of things.

Hot works

Did you know…?

Hot work is one of the leading causes of fires in manufacturing. The sparks and molten material from hot work can reach temperatures of over 500ºC and can easily travel more than 15 metres.

Find out more...

RSA Risk Control Guide – Hot Work

RISCAuthority RC7 Recommendations for Hot Work

[3] Source: RSA Claims

Dos and don’ts

- Don’t conduct hot work if a safer method of work is available. For example, it may be possible to do the job with a hand saw or pipe cutter or it may be possible to move the component requiring work to a workshop or to a safer working area
- Don’t allow anyone to carry out hot work unless they are trained and designated as competent
- Do obtain a hot work permit from the authorised person before any hot work starts
- Do make sure the person nominated to authorise hot work has the experience and training to identify the risks associated with hot work and be of suitable status to ensure compliance with procedures
- Do clear the area for 10 metres around the hot work process. Remove all combustible materials and flammable liquids and sweep floors clean. It is important to protect or clean thoroughly any surfaces impregnated with paint, oil and grease which can spread fires rapidly. Flammable solvents should not be used to clean surfaces immediately before work commences
- Do protect floor penetrations properly as well as anything that cannot be removed
- Do ensure that hot work equipment is in good repair
- Do provide at least two suitable portable fire extinguishers within the area of hot work operations and make sure all persons involved and undertaking fire watch duties are trained in their use
- **Do provide a trained person, not directly involved with the work, to carry out a continuous fire watch during, and for at least one hour following the hot work, including a final check to ensure that the working area and all adjacent areas, including the floors below and above, and areas on the other sides of walls, screens, partitions and above false ceilings are free of smouldering materials or flames**

Plan ahead and follow up

- Every site should have a formal policy for the control of hot work carried out by own employees and contractors outside of designated maintenance workshops. This should always be controlled by the use of a dedicated hot work permit to work
- All personnel involved with the hot work should be familiar with the means of escape from the premises. They should also be familiar with the method of raising the alarm and summoning Fire & Rescue services
- In sprinkler-protected premises, hot work operations should not be carried out while the water supply to the sprinkler system is shut off
- When hot work is being undertaken in premises fitted with automatic fire detection systems, it may be necessary to isolate the detector zone where the work is being carried out. The zone should be reinstated as soon as the work has been completed. Good practice would be to record this on the hot work permit so it is not missed on reinstatement
- The hot work permit must be issued for a specific task that is to be undertaken in a clearly identified area. Hot work permits should not be issued for protracted periods and separate permits should be issued for work which extends from morning to afternoon periods or across shifts
- Where hot work is being undertaken on composite building panels or similar construction elements, the type of insulating materials behind the metal or other non-combustible surface should be assessed. If combustible materials are identified or suspected, alternative methods should be employed

Forklift trucks

Did you know...?

A quarter of all workplace transport injuries are as a direct result of forklift truck accidents and five lives are changed every working day due to injuries resulting from forklift accidents. [3]

Find out more...

Vehicles at work

Workplace Transport Safety

[3] Source: British Safety Council

Dos and don’ts

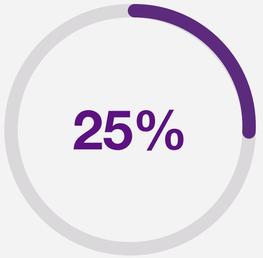
- Do make sure all operators are fully trained. Before a member of staff goes anywhere near a forklift, ensure they have received the proper forklift training. Forklift training should include safety procedures, pre-operation checklist review, operation training, and practice operation including use of safety restraints and PPE
- Do provide forklift safety equipment, such as hi-vis jackets, hard hats, steel toe-capped boots, and clothing that isn’t loose-fitting
- Do complete a documented pre-operation safety checklist
- Do ensure operators are aware of the capacity of the forklift
- Do impose a site speed limit. Reducing site speed to below 10 mph (15 km/h) can greatly reduce the likelihood of impact damage, as drivers have a greater time to react to potential dangers
- Do create a one-way system if it is practical, to reduce the likelihood of vehicle-on-vehicle impact
- Do separate vehicles/machinery from people. Make sure there are clearly defined pedestrian walkways (internally and externally). Ensure entry points to buildings or areas within the buildings are not shared
- Do introduce controls on vehicles reversing. In areas where reversing may be difficult but necessary, ensure there are dedicated trained staff to help vehicles reverse – commonly known as banksmen or signallers
- Do provide face shields and eye wash at charging points.
- Do make sure ensure charging areas are kept clean, tidy and free from rubbish and other combustible materials
- Don’t locate battery chargers in storage racking
- Don’t locate fork lift truck battery chargers in an area of site where there is a risk of explosion – for example, where flammable liquids are stored or handled

Plan ahead and follow up

- Develop a pre-operation safety checklist. Every driver is different, and most modern forklifts will allow users to find the perfect position for safe and effective forklift operation. The safety checklist should include the following:
  - Complete formal LOLER inspections including person lifting cages
  - Ensure the forklift is on flat ground
  - Check the wheels to ensure they are in good condition and fully inflated
  - Inspect the forklift’s body for damage and hydraulics for breakages
  - Check safety devices, set mirrors to the driver’s height, and adjust the seat to a comfortable position
  - Verify that the driver has 360-degree visibility before operation
  - Remove loose items from the cab
  - Check the safety lights, horn, steering and brakes before operation
- The internal and external layout of the site can influence the frequency and severity of impact damage. Tight comers, bottlenecks, obstacles and machinery can all lead to impact incidents. A full vehicle traffic management assessment should be completed including access to public highways
- Full assessments of the inherent fire hazards of the materials conveyed by the lifting power machinery should be completed and special care or precautions taken as necessary. For example, drums of flammable liquid should only be handled with lift trucks that are adapted for use in hazardous atmospheres with suitably adapted carrying equipment, e.g. drum clamps
- The working environment should be checked, swept regularly and cleared of obstacles and waste that could impact on the safe operation of the forklift truck

Electrical fires

Did you know…?



of accidental fires in the workplace are caused by faulty electrical appliances and leads.[4]

Find out more...

Find an NICEIC Contractor

Find an ECA approved contractor

Find a NAPIT registered contractor

Get information on BS 7671 IET Wiring Regulations

Learn about RSA's Property Risk Engineering services

Access HSE resources on Electrical Safety at Work (UK)

Access HSE resources on Electrical Safety at Work (NI)

Read the HSE guide on Electrical Switchgear Safety

[4] Source: Home Office

Dos and don'ts

- Do make sure that installation and testing of fixed installations are undertaken in accordance with UK regulations (see Planning Ahead)
- Do ensure electrical switch rooms are fire-rated. Any wall, floor or ceiling penetrations should be sealed with material of a similar fire rating to the barrier penetrated. Fire detection should be provided within the rooms with alarms sounding at a constantly attended location. Fixed fire protection should be considered for rooms with oil filled switchgear, critical electrical distribution equipment or critical control equipment
- Don't store any combustible materials near electrical switchgear, distribution boards and/or light fittings
- Do make sure all non-critical electrical equipment is turned off at night or whenever the premises are left unattended
- Do examine portable electrical appliances regularly – at least yearly
- Do complete Infrared Thermographic Surveys (see Planning Ahead) to identify potential problems before failure occurs
- Do make sure anyone who works on or with electrical equipment has had suitable training, knowledge, experience and supervision
- Do educate your staff about the risks of electricity
- Do operate a permit to work system for anyone working on electrical installations

Planning ahead

- Business owners and operators are responsible for the electrical systems and any electrical appliances in their establishment. This is governed by the current edition of the Institute of Engineering and Technology (IET) Wiring Regulations: BS 7671. These specify a range of documentation that should be kept on site to record work on electrical systems (including maintenance). Inspection, testing and maintenance should be by a member of the National Inspection Council for Electrical Installation Contracting (NICEIC), Electrical Contractors Association (ECA), SELECT (Scotland) or similar approved UKAS accredited bodies who are regulated for commercial installations. Review your record management practices to ensure they're up-to-date and compliant
- Find out when your next periodic inspection is due and set a reminder. Keep a copy of your Electrical Inspection Condition Report together with written evidence of any remedial work completed afterwards
- Routine checks of electrical accessories, cables and appliances for obvious visible wear and tear or damage can be carried out by an instructed person, although an electrically skilled person is required to carry out all routine planned maintenance of equipment, periodic inspection and testing and any urgent repairs
- All major electrical switchgear, major cable runs and key equipment such as circuit breakers, conductors and connections should be subject to a programme of infrared thermographic surveys, preferably annually as a minimum. Full records should be available for review, along with records to show that defects have been rectified
- If you're responsible for power transformers, an inspection of oil insulated units should be completed annually, with oil samples taken and analysed. Mineral oil analysis should include checks for moisture content, pH, dielectric strength and dissolved gases. Test certificates should be available for review. Load inspections and testing of protection systems and devices should be completed in line with original equipment manufacturer's recommendations or every five years, whichever is the lesser

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