TECH SHEET

Machine Shop Safety

EMC Insurance Companies

Despite advancements in machining technology over the past few decades, many hazards still exist for employees working with machine tools.

According to the Bureau of Labor Statistics, workers who operate and maintain machinery experience approximately 18,000 amputations, lacerations, crushing injuries, abrasions and over 800 fatalities each year. Most machine shops also contain flammable liquids and other chemicals that may increase the risk of fire.

Fire Prevention

Fires occurring in machines using oil-based coolant can cause significant damage within seconds, potentially spreading throughout the facility and causing extensive damage. Even with the operator standing by, machines have been completely destroyed by fire in a matter of minutes. The following guidelines can reduce the risk of fire in machine shops:

- **Housekeeping** — Floors, machines and other surfaces should be kept free of wood and metal chips, dirt, and debris. A "no smoking" policy should be enforced.
- **Flammable and combustible liquids** — Flammable and combustible liquids such as oils, gasoline, cleaners, solvents, paints and thinners should be stored in UL approved flammable and combustible liquid storage cabinets. No more than a one day supply of a flammable or combustible liquid should be stored outside of the cabinet in a UL approved storage can. UL approved rag cans are also available for the storage of rags soaked with flammable or combustible liquids.
- **Chemicals** — Chemicals should be stored in cabinets approved for that use. Do not store incompatible chemicals together. Material safety data sheets should be kept in the shop area for all chemicals used.
- **Hot work areas** — Hot work areas, such as welding and grinding areas, should be separated by at least 35 feet from flammable and combustible materials. Sparks should be controlled through the use of screens, if necessary.

Supervisor and Operator Responsibilities

Due to the many hazards that exist in machine shops, it is important for the plant manager to employ well qualified and safety conscious supervisors. Supervisors should have the experience, knowledge and training to mitigate hazards associated with machine tool use. Safety should be of primary importance to supervisors, and they should ensure that:

- Only trained and qualified operators are allowed to operate machinery and equipment.
- Machinery and equipment are in good mechanical and operating condition.
- Employees comply with all applicable safety regulations, such as wearing appropriate personal protective equipment, performing lockout/tagout and ensuring machines are properly guarded.
- All injuries and "near misses" are reported to the appropriate safety coordinator.

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- Regular safety inspections are conducted throughout the work areas.
- Employees do not work alone in hazardous areas.

Machine operators also have specific responsibilities to ensure their own safety and that of their coworkers. The following guidelines should be followed:

- Observe all safety regulations relating to machine tool use and operation.
- Provide suggestions for improving safety, such as enhancements to existing machine guards.
- Report any machine that does not have a guard covering all points of operation, nip points or cutting, shearing, punching and forming mechanisms.
- Wear appropriate clothing and personal protective equipment.
- Immediately report any machine tools that exhibit signs of excessive wear or have damaged or misused parts.
- Report any injuries or "near misses" to the supervisor immediately.
- Keep the work area clean.

Operator Training

In addition to their responsibilities described above, supervisors may also be responsible for operator training. Even if an employee has previous experience on similar equipment, it is imperative that they be trained on the rules specific to the company. Operator training should include:

- A description and identification of the hazards associated with the machinery the employee may operate.
- The safeguards present on each machine, how they provide protection and the hazards from which they are intended to protect.
- How, and under what circumstances, safeguards can be removed.
- Lockout/tagout procedures to be followed when guards are removed.
- What to do if a safeguard is damaged, missing or unable to provide adequate protection.
- Use, care and maintenance of personal protective equipment.
- Emergency planning for medical incidents, chemical spills, loss of power and evacuation alarms.

For Additional Information

EMC Tech Sheets: www.emcins.com

- Ergonomic Risk Factors
- Machine Safeguarding
- Lockout Tagout Program
- Fire Prevention Plan

Machine shop employees should also be trained to identify ergonomic risk factors in their jobs. Although many machine shop injuries involve the machine (crushing injuries, abrasions and amputations), injuries also result when the employee is handling materials being loaded into and unloaded from the machine. Ergonomic risk factors common to machine shops include:

- Excessive force — lifting heavy parts from pallets and bins
- Repetitive motions — continuously feeding parts into a machine
- Awkward postures — reaching to place parts into a CNC lathe

By training employees to identify these risk factors, they may be able to recommend solutions that not only improve their safety, but may also increase productivity and improve product quality.

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