

Alert: Machine Shop Lathes: Entanglement Hazards During High-Speed Polishing

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Hazard Summary:

A lathe operator was fatally injured while polishing a slotted steel shaft with emery paper. Before putting it in the lathe, he had machined three keyway slots along the 3" diameter shaft. After securing it between the chuck and the tailstock of the lathe he began polishing with a long strip of emery paper looped around the rapidly rotating shaft. The slots caught the strip of paper, which entangled his gloved hand and pulled his arm around the shaft, severing it from his body. He died later from extensive head, neck and chest injuries.

Three similar incidents, all resulting in critical injuries, were reported to the Ministry of Labour in 1993. In all cases, emery paper being used to polish workpieces in lathes entangled the operators' gloves or loose clothing, causing broken arms.

There is a hazard of entanglement whenever lathe operators use emery paper or similar material to sand or polish a rotating shaft with keyway slots or similar slotted profiles. Without warning, the paper may catch in the sharp edges of a slot, fold into the cavity, and wrap itself around the shaft, sometimes entangling the operator's gloved hand or loose clothing.

Locations and Sectors:

The machine tool industry; trade schools.

Recommended Precautions:

Manual polishing of workpieces on lathes shall be done **before** milling keyways or other slots. (Manual polishing can be done safely either with a file wrapped with emery paper or with an emery paper feeding device that is secured by the tool post.)

Gloves shall not be worn in any situation where they may get entangled in machinery.

The [Occupational Health and Safety Act](#) states that an employer shall:

"provide information, instruction and supervision to a worker to protect the health or safety of the worker" (25(2)(a)) and

"take every precaution reasonable in the circumstances for the protection of a worker" (25(2)(h)).

The [Regulation for Industrial Establishments](#) (R.R.O. 1990, Reg. 851) states:

"Jewellery or clothing that is loose or dangling or rings shall not be worn near any rotating shaft, spindle, gear, belt or other source of entanglement." (83(2))

The following requirements must also be observed by lathe operators and employers:

- Operators shall wear safety glasses and appropriate foot protection.
- All power transmission parts shall be guarded.
- The power to the drive motor shall be shut off before mounting or removing accessories.

As well, the Ministry of Labour recommends that the following safety precautions be taken:

- Ensure that the lathe has a start/stop button within easy reach.
- Use a lifting device to handle heavy loads.
- Ensure that lifting attachments will not become entangled with any moving parts.
- Ensure that permanent chip and coolant shields are in place.
- Remove the chuck wrench immediately after adjusting the chuck.
- Remove all tools, measuring instruments and other objects from the saddle or the lathe bed before starting the machine.
- Stop the lathe before taking measurements of any kind.
- Use a brush or rake to remove cutting.
- Never reach over a rotating chuck when filing.
- Never use a file without a handle.
- Never use callipers or gauges on a rotating workpiece.
- Use a centre support or follow rest while making heavy cuts on long slender workpieces.
- Maintain adequate working clearances around the lathe, and keep them free of oil and grease.

This Ministry of Labour Alert has no legal effect and does not constitute and is not a substitute for legal advice. If you require specific assistance with respect to the interpretation of a legislative provision and its potential application to you please contact your legal counsel.

Remember that while complying with occupational health and safety laws, you are also required to comply with applicable environmental laws.

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