

Workplace Health and Safety Bulletin



Cut-Off Wheel Fractures During Use: Worker Killed

Incident description

An air-powered angle grinder was being used to cut grooves into cast iron with a cut-off wheel. The cut-off wheel fractured during use and a large fragment of the wheel went through the worker's face shield and into the worker's face. The worker died as a result of the injury.

According to the manufacturer's specifications, the angle grinder is designed to operate at a pressure of 85 psi. The grinder has a built-in governor that limits its maximum speed to 7,600 rpm. In testing performed after the incident, the grinder appeared to be functioning according to the manufacturer's specifications. The air compressor to which the grinder was connected appeared to be functioning properly.

At the time of the incident, the cut-off wheel was secured to the grinder's drive spindle with a depressed centre backing flange designed to fit grinding wheels having depressed centres.

Contributing factors

The following factors contributed to the incident:

- To allow the grinder to be used in tight and awkward locations, its guard had been removed and had not been replaced.
- The grinder's accessory side handle had been removed, limiting the worker's ability to safely hold and position the grinder.

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- The cut-off wheel was not designed for this type of hand-held cutting operation. The cut-off wheel was rigid and flat, not suited for a depressed centre backing flange.
- The cut-off wheel was larger in diameter than what the grinder was designed for.
- The cut-off wheel's maximum safe operating speed of 4,500 rpm was less than the 7,600 rpm operating speed of the grinder.
- The cut-off wheel may have been subjected to sideways forces during use and the curved backing flange may have forced the flat wheel into a curve.
- The worker was using inadequate personal protective equipment considering the grinder guard was not being used.
- The way that grinding wheel were being stored may have damaged them due to mishandling.
- The angle grinder's maximum rpm rating was not clearly visible on the grinder.

Recommendations

As a result of the investigation into this incident, the following recommendations were made and apply to all users of air-powered grinders:

- (1) Use manufacturer-supplied grinder guards at all times.
- (2) Select the correct grinding wheel based on the operating speed of the grinder, the type of grinder being used, the type of work being performed and the manufacturer's recommended practices.
- (3) Install grinding wheels according to the manufacturer's recommended practices.
- (4) Use personal protective equipment that is appropriate for the hazards to which workers are exposed.
- (5) All workers using grinders should receive general grinder safety training and job-specific instruction.
- (6) Inspect grinder abrasives such as cups, discs, and wheels for damage at the time they are delivered to the workplace and prior to each use.


- (7) Operate grinders and other air-powered tool within the manufacturer's stated range of operating pressures.
- (8) Abrasive stones, discs, and wheels should always include complete product information so that they can be used properly.


For more information


 http://employment.alberta.ca/documents/WHS/WHS-PUB_al024.pdf
Air-Powered Grinders and Exploding Cup Stones – AL017

Contact us:

Province-Wide Contact Centre

 Edmonton & surrounding
area:
780-415-8690

 Throughout Alberta:
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Web Site

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Workplace Health and Safety

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Dial 310-0000, then the area code and telephone number you want to reach

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