



U. S. Department of Labor
Occupational Safety and Health Administration
Directorate of Enforcement Programs
Office of General Industry Enforcement

Hazards Associated with Hand-Feeding Bar Straightening Machines

Safety and Health Information Bulletin

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Purpose

The purpose of this Safety and Health Information Bulletin is:

1. To inform users of “caught by” and “struck by” hazards associated with unguarded bar straightening machines.
2. To urge that all employers using bar straighteners determine if a “caught by” or “struck by” hazard exists in the operation of any of their bar straightening machines.
3. To provide information that employers can use to address these hazards.

Background

OSHA’s Toledo, Ohio Area Office investigated a fatal accident involving a bar straightening machine. The machine involved was a two-roll-type straightener manufactured by Medart Inc. (See Figure 1).

The machine straightens round bar stock by passing the work piece (round bar stock) between (or through) a straight or concave roll. As the work piece is fed into the machine, it is drawn in and rotated by the rollers. The work piece can reach speeds of 1200 RPM or greater depending on the speed setting. The bar can also move at 50 feet-per-minute into the machine. The end product is a straight, round bar.

Observation of the referenced Medart machine in operation revealed that, when fed, the bar immediately

This Safety and Health Information Bulletin is **not** a standard or regulation, and it creates no new legal obligations. The Bulletin is advisory in nature, informational in content, and is intended to assist employers in providing a safe and healthful workplace. The Occupational Safety and Health Act requires employers to comply with hazard-specific safety and health standards. In addition, pursuant to Section 5(a)(1), the General Duty Clause of the Act, employers must provide their employees with a workplace free from recognized hazards likely to cause death or serious physical harm. Employers can be cited for violating the General Duty Clause if there is a recognized hazard and they do not take reasonable steps to prevent or abate the hazard. However, failure to implement any recommendations in this Safety and Health Information Bulletin is not, in itself, a violation of the General Duty Clause. Citations can only be based on standards, regulations, and the General Duty Clause.

spins at high speeds as it engages the rollers. In addition, as the bar is drawn into the machine, it also begins a whipping action depending upon the shape of the bar. The whipping action could cause the bar to strike anyone who is in close proximity causing serious injury or death.

In this case, the employer stated that a whipping guard is installed at feeding point of the machine; however, it did not prevent injury. Consultation with straightening machine manufacturers revealed that some operators do hand feed the straighteners and have had very serious injuries, such as open fractures of the extremities, traumatic amputation of digits, and a disembowelment. The manufacturers strongly

recommended that automated feeding equipment be installed to eliminate hand feeding.

Accident Investigation

The accident investigation revealed that an employee was hand feeding a round steel bar into a Medart two-roll straightener. The round bars have rough surfaces that increase the surface friction making it more likely to grab loose clothing. When the bar was engaged by the rollers, it immediately spun at approximately 1250 RPM and began to move through the rollers. At this point, the employee's clothes became entangled in the rotating bar and forcibly threw him onto the floor causing fatal injury. An emergency stop button was near the employee; however, the employee had insufficient time to actuate it.

The employer experienced a similar accident one month prior to the fatality when an employee's clothes became entangled in the bar fracturing the employee's leg. In this case, the employee was able to actuate an emergency stop button. An examination of past accidents revealed that several other employees had experienced injury from the bar whipping as it was being fed into the machine. One such accident resulted in a permanent disability.

Conclusions

OSHA's machine guarding standard, 29 CFR 1910.212(a)(1), requires employers to provide machine guarding to protect employees from hazards created by points of operation, ingoing nip points, rotating parts, and other machine operations. While guarding methods must be evaluated with respect to particular circumstances associated with a specific piece of machinery, employers who use bar straightening machines must use effective guarding methods to protect employees who otherwise would be exposed to machine hazards. While not an exhaustive list of permissible options, employers may consider using one or more of the following methods,

as appropriate, to prevent employee exposure hazards associated with bar straightening machines:

- Installation of a conveyor system to feed stock automatically into the machine;
- Installation of barrier guards (or enclosures) in conjunction with automatic feed tables or semi-automatic feeders;
- Installation of barrier guards (or enclosures) in conjunction with methods (e.g., pre-feeding bar de-scaling and smoothing) to reduce the possibility that the bar will catch employees or their clothing; and/or
- Use of a hand-feed or gravity-feed system in conjunction with specially designed feeding tools that prevent employee exposure.

Reference Standards

29 CFR 1910.212(a)(1)



Figure 1: Bar Straightening Machine