

# Rolling Mill

## *Application Note*

**Rolling Mills** produce coiled rolls of metal for secondary processors.

The powerful programmable controllers now available have the necessary computing speed for these applications.

In addition to relay ladder logic, they can be programmed with high-level computer-like languages. Routines written in C or other languages can be imported.

Tight coupling between sequencing, and motion control lets the system run at maximum speeds.

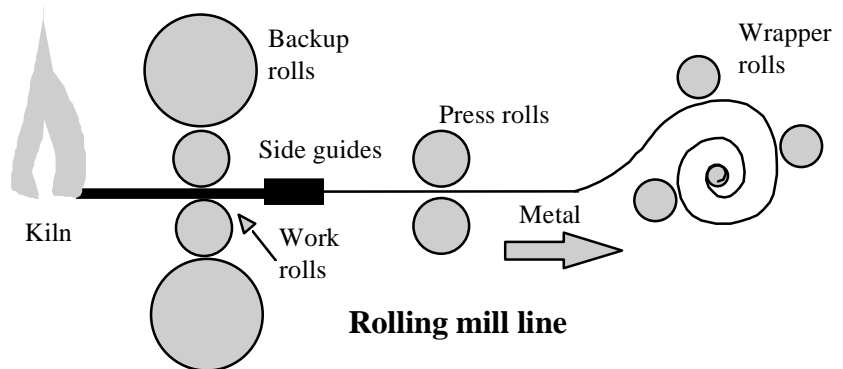
Rolling mills form billets into sheet stock and then into coils. These coils of metal are shipped to secondary processors.

The semi-molten billets come out of the kiln into work rolls. Hydraulic-positioned side guides come together to center the metal. Both position and pressure modes keep the sheet centered and keep it from deforming. The module also feeds back width measurements.

Pressure mode controls damage when the billet hits the leading edge of the work roll. Keeping tension as well as pressure is important to the wrapper.

Variable-crown work rolls move back and forth to compensate for the bowing that occurs when the metal is rolled into sheet as the billet moves through the rolls. Pressure controlled press rolls hold down the sheet to compensate for bending

Three wrapper rolls position and press the metal to form the coils. Pressure feedback is used on the wrapper to keep a constant tightness on the coil, and position feedback is for reporting coil size. The axis moves out to prepare for the leading edge and the next few turns of the next billet.



***A well planned PLC program can control Steel mill flow and motion control sequencing.  
Result: Higher throughput.***

**Important considerations:**

Hydraulic: Sufficient hydraulic oil, adequate accumulator pressure, proper valving and accumulator location, plus fast linear response valves with zero overlap, will ensure better control of machinery.

Controller: Fast PLC scan times and I/O update times of 40ms scans or less reduces time spent waiting for set states. Result: Increased throughput.

**Since most moves are short, minimum settling times on the motion control tuning are more important than high travel speeds.**

Benefits using Delta's motion control modules include

- High density modules:
- Fast 1 or 2ms loop time: quicker sets for higher throughput
- Error handling capabilities: the modules react to errors and report to the PLC quickly via bus communications
- Fully tested: Third Party Vendor module

For further information, contact Delta Computer Systems, Inc. at 11719 NE 95th Street, Suite D, Vancouver, Washington 98682. Telephone 360/254-8688. FAX 360/254-5435. BBS 503/283-5646. Our 24-Hour Customer Service Pager number is 360/699-7784.

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Delta Computer Systems, Inc. manufactures motion controllers, color scanners, and other industrial controls providing high performance automation solutions to a wide range of industries.