

APPLICATION SOLUTION: Kiln In-feed Control



Product Family: Electric
Product Used: RSX096, Roller Screw Actuator
Product Type: Standard

Application Requirements

Stroke: 1000 mm (40 in)
Speed: 150 mm/min (6 in/min)
Force: 102.3 kN (23,000 lbf)

Application Description:

In-feed control for lumber carts in a drying kiln.

Challenge:

A lumber processing equipment company needed to replace existing hydraulic cylinders used to control the feed rate of lumber carts as they entered a drying kiln. To index the large, lumber-filled carts, a hydraulic cylinder was applied in a walking-beam like motion between steel guide rails. The speed of the hydraulic cylinder was difficult to control due to the temperature fluctuations in the outdoor environment and there was a lack of reliable feedback. The hydraulic cylinder regularly operated in a wet, muddy environment and the low to high temperature fluctuations in the outdoor operation had created problems for the hydraulic cylinders such as poor performance in cold starts and premature seal wear.

The actuation speed was monitored by an external encoder mounted on a tire. As the lumber carts were indexed, the tire/encoder would rotate. If the tire was not positioned properly or the lumber stacked unevenly, the feed rate would not be properly measured causing operational issues. The in-feed speed was critical to the application because if the feed rate was too slow, the lumber could be over-dried causing unnecessary distortion and damage. Conversely, if the feed rate was too quick, cold lumber could drop the temperature of the kiln causing the lumber to have excessive moisture. Boards that were either too dry or too moist were less than ideal for the planing process that followed.

In addition, access to the hydraulic cylinder was limited making performing maintenance difficult and leaky hydraulic fluid hoses were an environmental concern.

Tolomatic Solution:

An RSX096 extreme force electric linear actuator with an IP67 rating was selected for this application. The high-thrust roller screw actuator provided the thrust capacity necessary to index the large load and the IP67 protection allowed the actuator to operate effectively in the wet, muddy, dusty outdoor environment. The long-lasting roller screw used in the RSX allowed this actuator to be maintenance-free while providing superior unit life compared to hydraulic cylinders. Additionally, the RSX was deployed with a servo motor which provided absolute positional feedback eliminating the need for the wheel/encoder feedback assembly and increasing overall control.

Customer Benefit:

- Increased speed control and feedback
- Increased reliability of equipment and reduced maintenance
- Operation in low and high temperatures for reliable long-lasting performance
- Improved quality with properly dried product ready for the planing operation that followed