

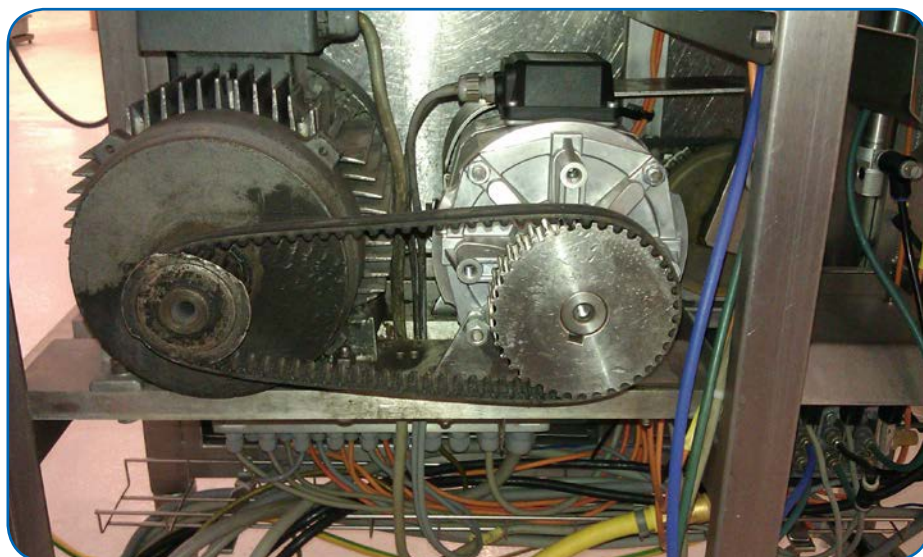
Slicing Downtime

Cheese packager utilizes oil shear technology to enhance productivity

Stan Porter, Force Control www.forcecontrol.com

An independent cheese packager in central Wisconsin packages millions of pounds of cheese every year. Whether shredded, sliced, crumbled or waxed, each package is designed specifically for a customer's unique needs. As a "toll processor," production line speed is critical to productivity as well as profitability. In order to ensure productivity improvements, the company replaced a dry clutch brake with a Posidyne oil-shear clutch brake for a slicing line. This increased processing speed while maintaining accuracy—thus cutting downtime and boosting overall productivity.

The slicing line—where cheeses are sliced to specified thickness using a cutting arm attached to a clutch brake—is a critical area. Accuracy is vital. With approximately a four-inch stroke, positioning of the cutting arm—and consistent repeatability typically determines success. Using a dry type clutch brake, this line "had a maximum speed, with good accuracy, of about 45-47 cycles per minute," according to the plant manager.



With any dry type clutch brake, adjustments are required to maintain accuracy. That's because the sacrificial wear surface abrades away with each actuation of the brake. To maintain their desired accuracy required plant employees to "turn the wedges in on the friction plate"—a 15-minute ordeal each week, or over 12 hours annually. While 15 minutes may not seem like a lot of time, at 45 cycles per minute, that's at least 675 slices a week lost to maintenance downtime.

Despite a fastidious maintenance regimen, the dry clutch brakes had a short service life, lasting only six to eight months. Replacing them required an hour or more—or another 2,700 slices lost to maintenance downtime.

Additionally, maintenance or service on other components of the line would cause the clutch brake to run idle—and build heat, which created problems. "If it sat idle without running any cycles for more than 10-15 minutes, we'd have to cool it down for another five minutes before running any product," recalls the plant manager. The result was even more lost production.



The frustration with the maintenance and adjustment as well as replacement costs for the dry clutch brakes prompted management to look at alternatives.

Bob Rohde at Linder Electric Motors suggested the Posidyne oil shear clutch brake from Force Control Industries which requires no maintenance or adjustment and typically lasts much longer than dry-type models. A demonstration trailer was brought on site where the production and management teams could see firsthand the viability of oil shear technology.

Force Control built and shipped a clutch brake overnight to accommodate the packaging company. The new clutch brake has increased cycle times by 10 to 20 percent. "Since we've installed the Posidyne, we have not performed any ongoing maintenance on it, nor have we made any adjustments," the plant manager said. Maintenance crews change the oil annually but the brake requires no other maintenance, repair or adjustment.

Although they have had the clutch brake idled for an hour or so on several occasions, they have not had any additional downtime due to heat buildup with the oil shear product. That is because with this patented technology, there is a boundary layer of transmission fluid in shear between the friction discs and drive plates. As the parts come together the fluid under shear will transmit torque between the two parts, as well as absorb heat. This eliminates direct contact of the friction discs and drive plates during high speed slip. Heat from the friction surface is dissipated as the fluid circulates to the housing—whether the clutch brake is engaged, or idled.

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Judging from their initial experience and review of warranty claims in terms of cycles, company officials figured that the Posidyne clutch brake would last approximately four years—or six times as long as the dry clutch brake that it replaced. Four years later, the brake is still running smoothly, indexing precisely, and allowing this facility to maximize production. In that time-frame, at least six dry-brake replacements have been avoided, saving the company thousands of dollars in replacement costs. In addition, avoid-

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ance of maintenance costs and lost downtime has been significant. Converting the 12 hours per year that was devoted to dry brake maintenance into production time allows the company to produce more than 33,000 additional slices of cheese.

“The two clutch brakes were within a couple hundred dollars of each other—and the Force Control product requires no maintenance or adjustment, and lasts a lot longer,” said the plant manager, “so it is well worth the additional investment.” **PTE**

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How Oil Shear Technology Works

Normal dry clutch brakes and brakes employ a sacrificial surface—the brake disc or pad—to engage the load. Having no good way to remove the heat caused from engagement between the disk and plate, this material must absorb the heat. These extremely high temperatures will eventually degrade the friction material. As the friction surface wears away and begins to glaze, the ensuing torque fade causes positioning errors which require adjustment or replacement of the friction surface.

Oil-shear technology plays a major role in ensuring that the cheese slicer at this independent cheese packager operates at its peak efficiency—even at a much higher cycle rate. Since a fluid film flows between the friction surfaces, as the brake is engaged, the fluid is compressed. The automatic transmission fluid particles in shear transmit torque to the other side. This torque transmission causes the stationary surface to turn, bringing it up to the same relative speed as the moving

surface. Since most of the work is done by the fluid particles in shear, by the time the surfaces actually meet or “lock up,” wear is virtually eliminated.

In addition to transmitting torque, the ATF also helps to dissipate heat, due to a patented fluid recirculation system. Along with torque transmission and heat removal, the fluid also serves to continually lubricate all components—thus extending their service life. Oil shear technology also provides a “cushioned” stop that reduces shock to the drive system—further extending service life. Unlike dry clutch brakes, the totally enclosed oil shear system is impervious to external elements such as wet, dusty or dirty environments, as are found in virtually all shingle manufacturing plants. Since the layer of oil eliminates wear, the Posidyne clutch brake provides a long service life. With elimination of wear comes elimination of adjustment—and increased “uptime” for this cheese processor. **PTE**