



Smooth DRIVE

Carmeuse successfully completes a modernization project involving conveyor drives at two Michigan operations. **BY KEVIN YANIK**

As Carmeuse Lime & Stone systematically modernizes its plants in the Great Lakes region, opportunities arise to marvel one last time at the longevity provided by the century-old equipment the company is replacing.

Similar examples could be found at Carmeuse's Calcite operation in Rogers City, Michigan, and the Port Inland operation on the Upper Peninsula in Gulliver.

At both sites, some of the mechanical equipment dated back to the early 20th century. Both Calcite and Port Inland originally had dual-drive arrangements with bull gears, which provided the conveyor systems tremendous durability across a number of decades.

"You really can't beat old fabrication and old engineering."



A conveyor pulling finished product from a mill at **Carmeuse's Port Inland operation** in Gulliver, Michigan, is where a TM800 drum motor is in place. PHOTOS COURTESY OF MATT LEPP



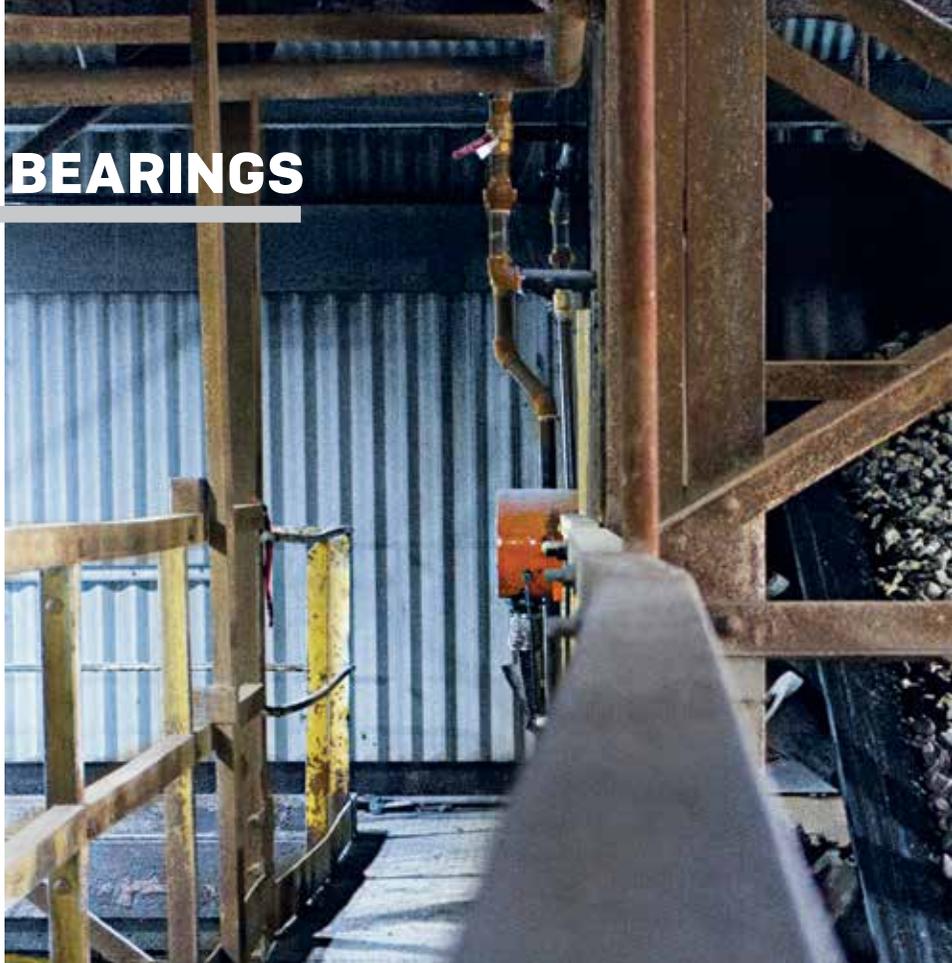
MOTORS, DRIVES & BEARINGS

Reduced noise, enhanced safety and simplified maintenance are among the benefits Carmeuse is experiencing.

says Greg Kolodziej, project manager for Carmeuse in the Great Lakes region. "Guys back then built things to last."

Still, the shine on those systems eventually faded. The bull gear drives were a bit noisy, for one, and when they finally ceased to operate they would be expensive to replace.

Accessing gearboxes with the old setups



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Carmeuse has two TM800 drum motors in place at its Calcite operation in Rogers City, Michigan.

was another challenge Carmeuse encountered, and the electrical components involved in the systems weren't nearly as efficient as modern-day components.

So Carmeuse sought to replace its large bull gear drives while also replacing and upgrading electrical systems.

"One of the reasons we wanted to replace the system at Calcite was to update the electrical," Kolodziej says. "Some of the electrical setup was like Dr. Frankenstein, throwing a switch. We had some maintenance issues with spillage and, as part of the plant, there was no good access to it."

A century ago, a quarry operation might work around those challenges. But today's high demands require steady production and minimal downtime – two qualities Carmeuse's aged systems weren't providing at a preferable rate. So, Kolodziej embarked on a mission to find solutions.

"Our sites had a couple of drive replacements that were old bull gear drives with dual sprockets that governed the speed on conveyors," Kolodziej says. "So we went

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after that along with electrical upgrades.”

MAJOR MODERNIZATION

Because both Calcite and Port Inland were experiencing similar conveyor drive dilemmas, Kolodziej sought a solution that could be applied to both sites.

The two sites in northern Michigan are within a three-hour drive of each other. So installing a common drive

with a single spare that could serve both plants, if needed, would be a nice victory for Carmeuse.

One option Kolodziej came across as he explored equipment was a motorized head pulley drive from Van der Graaf, whose representatives paid both Carmeuse operations multiple visits to gain an understanding of the systems in place and the requirements Carmeuse had.



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“Some people look at new technology with a little bit of a skeptical eye. I’m a little more apt to go after these things based on my background in crushing and processing.”

GREG KOLODZIEJ
CARMEUSE

“We were impressed with what Van der Graaf brought to the table,” Kolodziej says. “They were good about double checking the engineering and checking the requirements to make sure the application they proposed would actually fit our needs. They were interested in working with us as a partner to find a solution.”

According to Kolodziej, the best part of partnering with Van der Graaf was that

the vendor was able to provide a like drive for Calcite and Port Inland. Carmeuse purchased two Extreme-Duty TM800 drum motors that provide 150 hp for Calcite. Carmeuse also bought a TM800 for Port Inland, as well as a 40-hp model that drives a belt feeding into a neighboring customer.

For Carmeuse, one of the beauties of the TM800, which measures 31.5 in. in diameter, is that the motor, gear drive

and other moving parts are all enclosed inside the drum.

“Using a system like that where you don’t have many different components that have to attach to each other helps out in the long run,” says Nathan Marcy, a mechanical engineer at Krech Ojard & Associates, a Minnesota-based firm that teamed with Van der Graaf on the design of Carmeuse’s new conveyor drive systems. “Having a self-contained system like that is very valuable.”

Yet some operations might hesitate to adapt, owing to unfamiliarity.

“When the components are all encompassed in the pulley itself it can be tough for people to visualize,” Marcy says.

Still, the design of the TM800 didn’t stop Kolodziej. In fact, the design was something he largely welcomed because of the space constraints related to Carmeuse’s old bull gear drives.

“One bonus of going to this style drive is it allowed us to get into areas with personnel and small equipment for cleanup of any spillage in that area and maintenance that we weren’t able to previously access with the large bull gear drives in the way,” Kolodziej says.

Another positive takeaway: The new drives can be hooked up to a variable-frequency drive (VFD) that allows for changing speeds on the fly.

“We weren’t able to change speeds at all before,” he says. “This was a major benefit, especially in Port Inland’s case.”

When generally upgrading equipment, Kolodziej seeks to enhance processes anytime Carmeuse takes on a project like this one.

“We look to improve things as we’re doing these projects,” says Kolodziej, adding that he may tackle up to 60 projects across Carmeuse’s Great Lakes sites during a given winter. “Knowing the constraint with the conveyor drives, we said let’s look at upgrading this system while we’re in here tearing it up.”

“If we replaced it, what is it going to gain us? We looked at service life on the

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Van der Graaf drives, and they're looking at 50,000 hours for oil change," he adds. "Maintenance is huge for us, and that's superior to a gearbox where you're consistently changing oils."

THE APPLICATIONS

In terms of how Carmeuse is utilizing each of the TM800 drum motors, Kolodziej offers a breakdown.

"With Port Inland's [150-hp] drive, that [replaced] the same type of old bull gear," says Kolodziej, who adds that the TM800 at Port Inland drives a conveyor that pulls a finished product from a mill onto a stockpile. "One of the issues we were having there was belt slippage. There was a space constraint there, too, and the new drive fit in really well to the application. It was a slide-in, slide-out system, and the drive there is running off a VFD where you can slow it down and allow it to have more grip."

The experience at Calcite, where the drives are fundamental to a loadout system for water-bound vessels, has been a pleasant one as well.

"With the limited time of year we have, we really can't afford downtime," says Kolodziej, adding that the conveyor drives at Calcite are fundamental to moving stockpiled products onto vessels. "Most of our stone goes out by boat. We're kind of at the mercy of the weather and boat availability."

Based on the performance of the drum motors, Kolodziej may find other opportunities to put TM800s – or related equipment – to use.

"Our mindset on this project going in was we're going to try these at a couple of different sites as a comparison and see them in different environments doing different things," he says. "If we find a spot where it's tight and you're walking around drive belts – if there are places where we need more access to keep employees safe – we may share this technology with other engineers in North America."

If Carmeuse goes that route, it can share data from loggers Van der Graaf put in place on its systems. The loggers provided Carmeuse details about amp draw and operating temperature, among other variables.

"We're sending performance data back to [Van der Graaf's] office," Kolodziej says. "They compiled it and shared with us. I had a lengthy discussion when they came back to gather them about the startup on the drives and how they're operating." **P&Q**

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