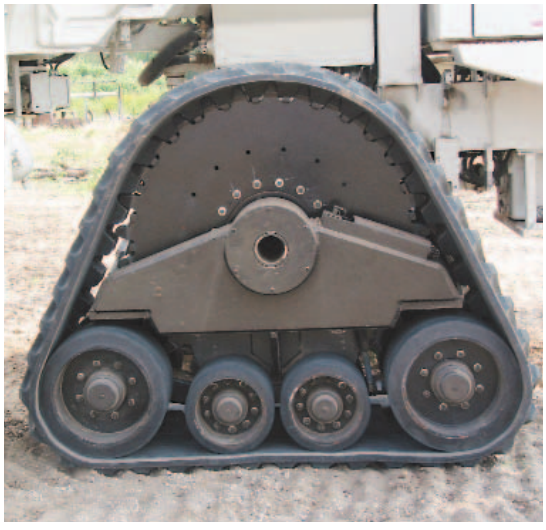
As seen in the Nov 18th, 2004 issue of Machine Design

Composite bearings keep heavy equipment on track



Modular track systems for off-road vehicles experience enormous loads, both from the weight of the equipment itself as well as from the shocks of inhospitable terrain. **ATI Inc.,** Mt. Vernon, Ind., (*ATI-tracks.com*), makes track systems for scraper tractors, soil stabilizers, and seismic vibrators, as well as mining, forestry, and geophysical-exploration equipment.

The rubber-track modules reduce compaction and soil pumping, increase flotation in wet and muddy conditions, enhance traction for greater pulling efficiency, and lower the center of gravity for better stability. They also absorb impacts, cushioning the ride. Because of demanding operating conditions, the company had to evaluate a number of different bearings for the front idler supports which tension the rubber tracks.

Composite plain bearings in construction-equipment track systems handle extreme loads and demanding operating conditions.

"We tried both needle bearings and steel-backed bushings, but they couldn't handle the loads," says Ken Juncker, ATI president. For instance, vertical loads can reach 25,000 lb per module on some construction vehicles, he explains, and that does not include additional shock loads from running over rocks and debris.

To stand up to these extremes, ATI turned to fiber-reinforced, composite plain bearings. Produced by **GGB** (formerly Glacier Garlock Bearings) in Thorofare, N.J., (*garlockbearings.com*), the Gar-Max bearings consist of PTFE, polyester, and filament-wound glass fibers impregnated with epoxy resin.

Predicted bearing life in the modular-track systems is approximately 25,000 hr, says Juncker. This gives a 2 to 2.5× safety factor, based on customers requiring 10,000 to 12,000 hr on construction equipment, he adds.

In addition to high load capacity, Gar-Max bearings provide good friction and wear properties under low-speed oscillating or rotating movements, like those of the tensioning mechanism for ATI's track systems. The bearings also resist shock loads and chemical attack and are self-lubricating, so they require no maintenance. And the bearings operate reliably over a broad temperature range, from –52°F in Alaska to 110°F in the sand dunes of Oklahoma, says Juncker. Rated temperature range is –148 to 320°F.

The Gar-Max bearings have performed problem-free to date, he adds, and they are being used in several new off-road modular-track systems.

— Kenneth J. Korane

For more information on ATI Inc., Circle 406

For more information on GGB, Circle 407