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Smart Maintenance And More Robust Parts Boost Compressor Uptime

By Colter Cookson

For the natural gas compression industry, good is never good enough. Even when they benefit from compression equipment robust enough to support 99% uptime guarantees, operators continue to look for ways to reduce downtime, improve throughput and limit emissions.

Low-leak packing, longer-lasting materials and more informed component selection are helping compressor owners get more from their equipment. But even with the best components, keeping compressors running requires a strong maintenance program executed by skilled technicians.

Fugitive Emissions

Producers and midstream companies are becoming increasingly proactive about reducing emissions, assesses Ben Berwick, product manager at Cook Compression, a division of Dover Precision Components. "Our engineers are getting requests from customers to highlight ways to reduce emissions," he reports. "These customers want to get ahead of regulations and show the public they are strong environmental stewards."

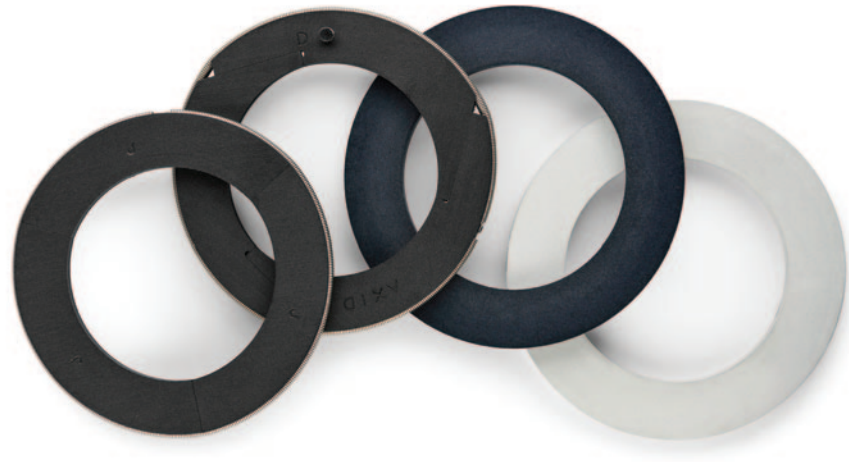
To address emissions, Berwick says Cook Compression is deploying sensors and cloud-based telemetry to monitor packing-associated leakage rates. "Our goal is to establish a baseline and improve the packing so we can reduce venting," he relates.

Minimizing packing leaks and other emissions frequently boosts profits, notes Craig Martin, Cook's chief engineer for rings and packing. "When packing fails, the compressor owner either needs to run it with a leak until it can be fixed or shut the compressor down. Either approach costs money," he says.

"Proactive maintenance is one of the best ways to keep leaks from occurring, so we are encouraging customers to adopt maintenance plans that include periodically pulling the packing out and repairing or replacing it," Martin reports. "In some applications, this maintenance can pay for itself within a few months."

Based on laboratory tests and past experience, Berwick says, Cook often can estimate packing's remaining useful life and recommend maintenance schedules that minimize unnecessary work. He cautions that packing and other components sometimes experience shocks that accelerate their degradation.

"To identify those situations, we are looking at data from different elements of the package and applying statistical modeling and pattern recognition tech-



To improve compressors' performance and reliability in demanding applications, Cook Compression can tailor the materials used for sealing rings and other compressor components to specific environments. The company points out that it molds and blends many materials in house.

niques that are underpinned by Cook subject matter experts. This will allow us to recognize early onset of a packing issue, six-12 weeks before it might warrant a unit shutdown," he says. "We also are developing more resilient materials that should deliver the expected life over a broader range of applications."

Martin stresses that getting the right product for the application is key. "To keep OEM and end-users' costs down, packing tends to be a one-size-fits-all product," he notes. "But in challenging or unusual situations, we often need to do some customization. By adjusting how we configure seal rings within the packing case or the wear materials we use, we can create packing that will have an acceptable life and cost."

To shorten design times for custom components, Martin says Cook's application engineers tap Dover Precision Components' India Innovation Center team to run finite element analysis and other simulations overnight. He adds that Dover Precision Components blends and molds in house many of the materials Cook uses.

"This has helped us reduce costs while maintaining quality and consistency," Martin says. "It also lets us create new wear materials more quickly when that's the best way to solve a customer's problem."

In midstream applications, one of the main drivers of new materials is the quest to reduce or eliminate lubricant consumption. "We hear over and over from midstream companies how frustrated they are at spending money on lubricating oil that flows down the pipeline and creates problems down stream," Berwick reports.

Martin points out that demand from refineries, petrochemical facilities and the emerging hydrogen vehicle industry also supports this materials research. "For some nonlubricated compressor applications, we are developing affordable materials that push component life from 8,000 hours to 16,000 or 24,000," he says. "This should bring replacement intervals in line with other maintenance."❐