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Saving Spindles

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Manufacturing saw blades is a tough business. Tough on the machines that are doing the manufacturing, and tough on the employees running the machines.

Peerless Saw Co., a manufacturer of industrial saw blade bodies, knows all too well the demands of the business. And with nine rotary grinders—each specifically designed to grind circular saw bodies ranging from 4" to 40" in diameter—Peerless is jam-packed with machines that had better work properly to satisfy customers' demands.

The Groveport, Ohio-based manufacturer faced a major dilemma in 2002, when some of its machines were failing at an alarming rate. With machine down time as a result of newly rebuilt spindles failing because of bearing contamination and employees spending time trying to fix them, Peerless needed to find a solution quickly.

To ensure the grinders keep running, they require flood coolant during the grinding cycle—a process which can range from 4 to 60 minutes depending on the blade's diameter. A blade is ground in two stages; after one side is ground, the blade is flipped to grind the other. The large surface area produces a high volume of abrasive and corrosive swarf, which is tough on the equipment — especially the spindle bearings.

Ironically, the coolant, which was meant to help keep the grinders running smoothly, was the very culprit causing the machines' early demise. "After several years of operation we found that the spindles on these grinding chucks were repeatedly failing every 6 months due to coolant penetrating the front seal and destroying the spindle bearings" said Tim Gase, president and owner of Peerless.

END USER

Peerless Saw Co.

CHALLENGE

Avoid rotary grinder failure caused by spindle bearing contamination.

SOLUTION

An air-purge seal that prevents contamination from entering the spindle.

When a spindle starts to fail, the surface of the saw blades will start to develop chatter marks or spokes around the center of the body. This leaves the saws in an unacceptable condition for sale, and subsequently, forcing them to be scrapped.

Working with several spindle rebuilders, Peerless tried repeatedly to fix the grinders. Before replacing the spindle, the company would have the operator make adjustments to isolate the problem and verify that it was really coming from the spindle—another time-consuming process that cost valuable production time.

Gase added: "The process of replacing a spindle on our machines also caused a great deal of downtime, typically taking two shifts to pull a bad spindle out and install a rebuilt unit. Initially we rebuilt these spindles with seals that closely matched the original manufacturer design, but the life of each rebuild was not good. There were some spindles that failed within weeks of being rebuilt, from bearing contamination. It was frustrating and expensive.

One German company's new spindle seemed to do the trick, but ended up lasting only six months before failing. Peerless was becoming desperate for a solution.

Enter Setco Sales Co. The Cincinnati based manufacturer and rebuilder of precision spindles and slides happened to have the remedy. According to Bob Hodge, Setco's vice president of engineering and development, "We were ready to release our Universal AirShield and the Peerless Saw application was just the right opportunity to showcase the reliability of the AirShield. The maintenance record at Peerless Saw proved the existing labyrinth seal design was not doing the job."

The "self-contained" Universal AirShield is a retrofitable cartridge seal for problem applications like Peerless Saw was experiencing. In addition, the air-purge seal that uses regulated air pressure and a flexible lip seal to prevent coolant and contaminants from entering the spindle.

It has now been three years since Peerless first installed on a failing grinder, which is still running without any contamination issues. Gase said: "Our investment to retrofit our spindle with the Universal AirShield has saved us thousands of dollars in spindle rebuilds and reduced our maintenance costs, while increasing productivity. Since that time, several other machines were retrofitted with AirShields and not one has failed. I am sure we will eventually have all nine of our grinders operating with the AirShield spindle seals."



After 3 years in a grinding application at Peerless (bottom), this AirShield spindle seal continues to operate without failure.