

CASE **Study**

**GARDNER DENVER REDLINE™ PACKING
CUTS MAINTENANCE TIME IN HALF**

CHALLENGE

As well complexities, temperatures, pressures and lateral lengths increase, so do the demands placed on service companies to provide capable rigs and technologies to operate in an efficient and safe manner. With many service companies taking a measured approach to increasing operating costs, often, new pressure pumping equipment is not in the budget. New pumps can cost as much as \$450,000, causing many service companies to make existing equipment work. However, money is being invested in consumables (packing, pistons, valves, etc.), allowing an older pump to continue running in even in today's harsh conditions.

Until recently, consumables have not been given much consideration. There were no distinguishable characteristics between them, allowing service companies to choose the cheapest or most convenient. As the industry exited the downturn, customers simply had to find ways to be more efficient and extend their equipment's life without breaking the bank.

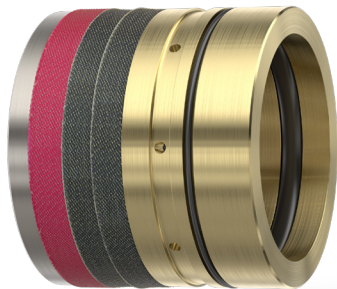
Generally, packing is the second most common reason to have to tear into a pump. Every instance of this causes expensive downtime and exposure time. Frequent packing servicing places additional strain on frac pumps and their components.

INNOVATION

For more than two years, Gardner Denver's experienced product development team conducted extensive research into packing failures, product design and property makeup in an effort to improve packing performance and extend product life in fracking operations. Historically, packing has to be changed out/serviced at approximately 200-250 hours of run-time, causing downtime and exposure time, safety risks and costing operators money. Frequent packing servicing places additional strain on frac pumps and their components.

After two years of research and development and extensive field-testing, and as part of its continued commitment to innovation, Gardner Denver launched the first of its Redline™ Consumables, Redline Packing, in February of 2018.

Redline Packing has redesigned header and pressure rings. Each ring was separately engineered to perform a specific function based on previous research and analysis of field results. Both were designed to give industry-leading performance in today's toughest high-pressure environments, directly translating to longer product life in all major shale plays. The increased asset utilization rate allows for packing to be changed at the maintenance facility rather than an operator location, decreasing non-productive time (NPT) and reducing exposure time for service technicians.



PUT OUR LEGACY TO WORK

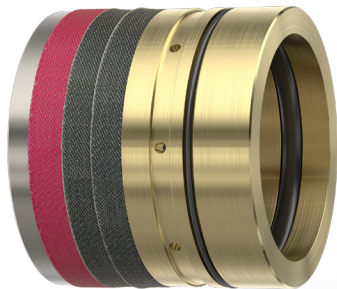
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Gardner Denver has had a commitment to innovation for more than 150-years and our Redline Packing is the perfect example of our company addressing today's challenges and providing a real solution

Neal Spence

Area Sales Manager –
Gardner Denver



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THE RESULTS

In December of 2017, Gardner Denver teamed up with a leading service company to run Redline Packing in SCOOP and STACK plays in western Oklahoma, where high pressures and challenging conditions were standard.

Conditions included 9,500 psi average pressures, 100-mesh sand and 105-bpm flow. Upon test completion, 144 stages were completed. The incumbent averaged 50 stages with 32 failures out of 45 sets of packing (71.1% failure rate). Redline Packing had one failure out of 40 sets of packing (2.5% failure rate).

Since the conclusion of the test and compilation of data into definitive results, the customer has transitioned to Redline Packing on more of its fleets, which have delivered additional positive results.

In another field test the incumbent packing lasted 50 stages at two hours per stage. After seven complete jobs, Redline Packing had completed 200+ stages with three packing failures, saving the customer in excess of 50 hours of scheduled maintenance. This savings equated to lower NPT and increased productivity. Because Redline Packing lasted well past the service company's scheduled maintenance intervals, exposure time was reduced, keeping crews safer and eliminating costly downtime.

This translated to the customer having two additional days of pumping, generating profits instead of paying for non-productive downtime.

Today, the customer runs Redline Packing and as their fleet continues to grow, they anticipate installing this exceptional packing in every fluid end.

“Gardner Denver has had a commitment to innovation for more than 150-years and our Redline Packing is the perfect example of our company addressing today's challenges and providing a real solution,” said Neal Spence, Area Sales Manager, Gardner Denver.

FIELD TRIAL RESULTS INCLUDED:

- **Outlasting the incumbent by over 2x**
- **Pumping over 100M lbs of sand**
- **Performing exceptionally well in a high pressure environment**
- **Reducing maintenance time by 50%**
- **Diminishing NPT**
- **Improving fleet utilization and safety (reducing exposure time)**

PUT OUR LEGACY TO WORK