

CASE STUDY: Enhancing Safety, Reliability, and Longevity in OCC Repulpers with Custom Gland Follower Design

Overview

Industrial pulp and paper operations depend on rugged, efficient machinery to process difficult materials day in and day out. One of the most critical and abused components in these systems is the seal area of large repulpers—specifically the gland follower, which compresses the sealing material to prevent leakage around the rotating shaft. In 2016, a major paper mill operating a large OCC (Old Corrugated Container) repulper contacted SealRyt Corp. seeking a better solution to their existing black iron gland follower, which was not only heavy and difficult to handle but also prone to rust and corrosion in the harsh environment.

SealRyt, known for designing advanced sealing and shaft stabilization solutions, responded with a custom-engineered aluminum gland follower tailored for durability, weight savings, and corrosion resistance. The follower featured a modular four-piece design to reduce handling burdens and improve serviceability. Four years later, after proven performance and valuable customer feedback, a second, more robust version—also in four pieces—was developed and installed. As of mid-2025, the upgraded unit has been in continuous service for four years with zero reported issues.

This case study examines the process of designing, refining, and implementing this custom gland follower, highlighting the measurable benefits of working with a responsive, application-focused manufacturer.

Background: The Challenges of Sealing an OCC Repulper

OCC repulpers are heavy-duty machines used in paper mills to break down recycled cardboard into fiber slurry. This process involves high levels of abrasion, heat, moisture, and contamination from paper coatings and debris. The mechanical seals and gland packing in these systems are critical to operation, yet frequently exposed to severe conditions that can rapidly degrade components.

In this case, the repulper in question was sealed using SealRyt's proprietary SLR® Sealing System, which was performing well. However, the mill's maintenance team identified a persistent pain point in the equipment: the gland follower—the bolted flange that applies pressure to the packing—was made of traditional black iron, weighing over 80 pounds and suffering from rust and corrosion that complicated removal and reinstallation.

Heavy, corroded followers are not just an ergonomic burden; they can delay maintenance, increase injury risk, and result in uneven compression of the packing, reducing sealing efficiency.

Phase I: Custom Four-Piece Lightweight Design (2016)

In response to the mill's request for a lighter, non-corroding follower, SealRyt's engineering team designed and manufactured a custom aluminum unit tailored to the repulper's dimensions—approximately 27.5 x 30 inches in size. From the beginning, the design featured a four-piece modular construction, allowing for easier handling and installation by a single technician without the need for lifting equipment.



Photo: Four-piece gland follower designed for OCC repulper.

Key features of the 2016 design included:

- **Weight Reduction:** The aluminum follower reduced total weight by more than 50%, dramatically improving ease of handling during installation and maintenance.
- **Modular Construction:** The four-piece design allowed each section to be handled independently, reducing physical strain and simplifying alignment during install.
- **Corrosion Resistance:** Aluminum construction eliminated the rusting issues of the original black iron component, reducing downtime and the need for anti-corrosion coatings or replacement.
- **Precision Fit:** Machined to exact specifications to match the existing hardware pattern and shaft diameter, ensuring seamless installation.

The first unit was installed in 2016 and placed into regular service sealing an OCC repulper using SealRyt's Style 7413 and Style 2017 packing sets with the SLR® (Structural Lantern Ring) System. Over the course of four years, the follower performed exceptionally well with no significant degradation—delivering a measurable improvement in ergonomics, service efficiency, and corrosion resistance.

Phase II: Reinforced Four-Piece Redesign (2021)

In 2020, following routine service feedback, the customer approached SealRyt again with a request to make the successful design even more durable. While the 2016 version had addressed their primary concerns, the team identified opportunities to strengthen the gland follower further to handle high bolt loads and resist fatigue in the most stressed locations.

In response, SealRyt engineers developed a second-generation aluminum gland follower, retaining the four-piece modular layout for ease of handling, but making targeted structural upgrades.

Enhancements included:

- **Thicker Cross-Sections:** Additional material was added in load-bearing areas to resist deformation under compressive stress.
- **Joint Reinforcements:** Corners and flange junctions were redesigned with added gusseting and optimized geometry to prevent fatigue cracking and improve load distribution.
- **Upgraded Alloy:** A stronger, harder aluminum alloy with improved tensile properties was selected to increase resistance to galling and mechanical wear.
- **Protective Coating:** The surface was treated to provide an extra layer of protection against galvanic reactions and chemical exposure in the moist repulper environment.

Throughout the redesign, care was taken to maintain compatibility with the existing SLR® and braided packing configuration, ensuring a drop-in replacement that delivered enhanced performance without process changes.

Performance Results (2021–2025)

As of July 2025, the enhanced four-piece aluminum gland follower has been in continuous operation for four years. According to the mill's latest maintenance report:

- Zero failures or cracking
- No signs of corrosion
- Sealing performance remains excellent with minimal packing readjustment
- Ease of removal and reinstallation maintained

The repulper continues to operate using SealRyt Style 7413 and Style 2017 packing sets along with the SLR® system, with the gland follower contributing to a stable, reliable seal environment under demanding conditions.

Key Benefits Delivered

The success of this two-phase development process highlights the impact of SealRyt's custom-engineering capability and focus on field feedback. The project delivered:

1. Superior Safety and Handling

The original shift to aluminum and four-piece construction drastically reduced weight and made safe, single-person installation possible—especially valuable in confined service spaces.

2. Corrosion-Free Longevity

By eliminating rust-prone black iron and introducing a coated aluminum alloy, the new followers remove a major maintenance and reliability concern.

3. Durable and Robust Engineering

Targeted upgrades to material thickness and alloy selection in 2021 delivered a tougher, more fatigue-resistant component without sacrificing modular convenience.

4. Consistency Across Two Iterations

Both versions maintained the same four-piece modularity and sealing compatibility, allowing the mill to integrate upgrades without retraining staff or modifying hardware.

5. Feedback-Informed Innovation

SealRyt's willingness to iterate based on real user experience resulted in a stronger long-term product and deepened customer trust.

Conclusion: Practical Innovation Through Partnership

This case reflects what makes SealRyt different: not just selling components, but engineering practical, reliable solutions for real-world problems. The gland follower project demonstrates how iterative design, close collaboration with maintenance teams, and thoughtful material choices can lead to safer, more reliable operations—even in harsh, high-load environments like OCC repulpers.

The ongoing success of both gland follower versions proves that lightweight and modular components can also be robust and long-lasting. For plant managers and reliability engineers facing similar challenges with heavy, outdated, or failure-prone seal hardware, this case offers a compelling model for how targeted innovation and customer responsiveness can yield long-term operational gains.