

## Engineering a Better Gearbox for High-Volume Tank Processing

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The heart of many of these industrial mixers is the **gearbox**. However, most “off-the-shelf” commodity gearboxes are simply not designed to handle the unique mechanical stresses of high-volume tank processing.

DieQua was tasked with a project to re-engineer a standard mixer drive, focusing directly on the common failure points that plague maintenance teams: **noise, vibration, and seal integrity**.



Photo courtesy of DCI, Inc.

# The Challenge: Common Points of Failure in Commodity Gearboxes

- **Mechanical Wear:**

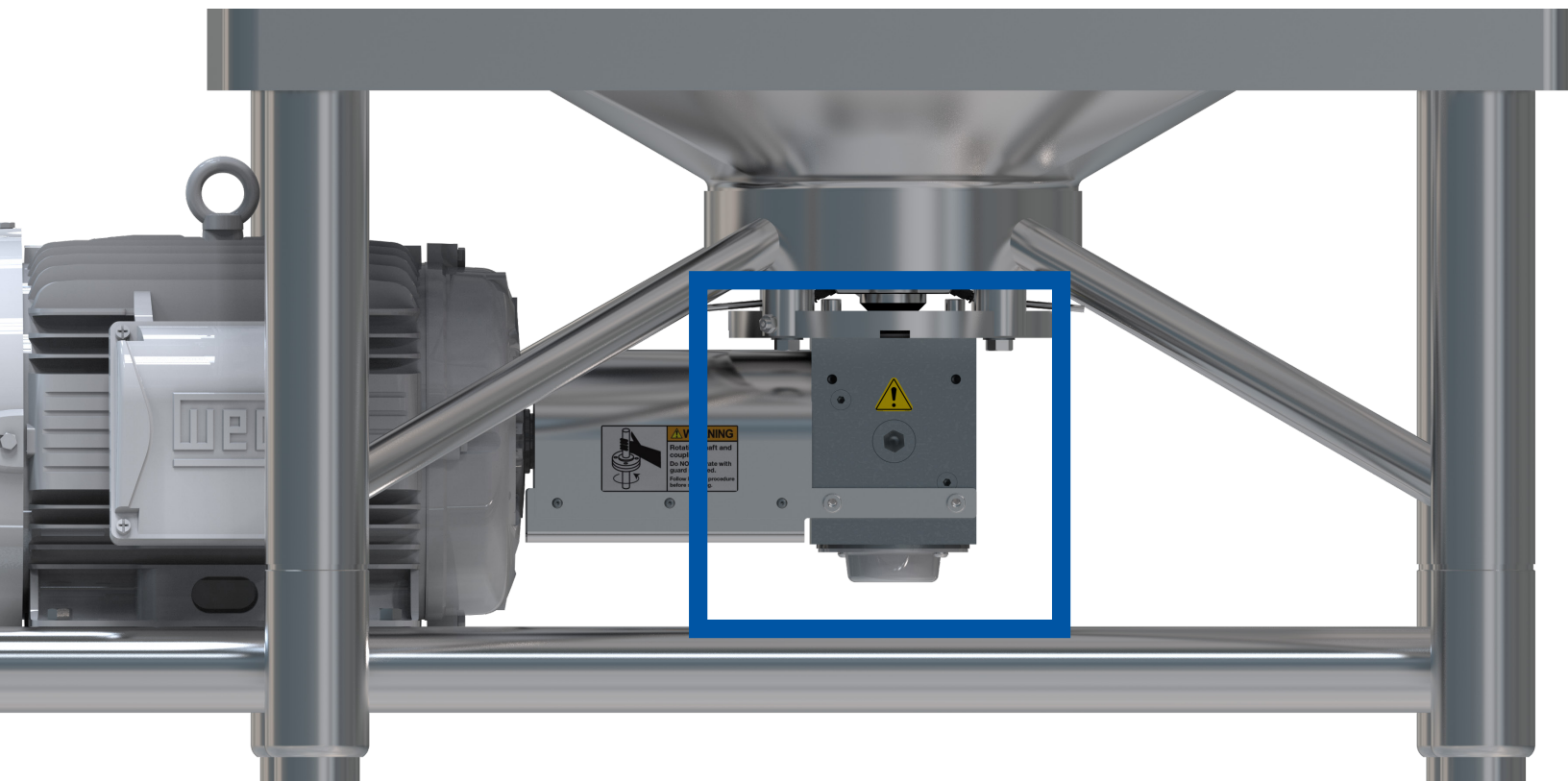
High vibration levels lead to premature bearing and gear fatigue.

- **Environmental Ingress:**

High-pressure washdown procedures frequently force water into breathers or past standard seals, contaminating the internal lubrication.

- **Material Degradation:**

Standard exterior coatings frequently blister and fail when exposed to the caustic sanitizing chemicals.



## The Solution:

# A Customized Spiral Bevel Gearbox

Our engineers collaborated with the client to build a custom solution by implementing four key mechanical upgrades:

### **1. Precision Spiral Bevel Gearing**

We moved away from straight bevel gears in favor of spiral bevel geometry. This shift results in smoother power transmission, significantly less mechanical wear, and a much quieter processing floor.

### **2. Total Ingress Protection**

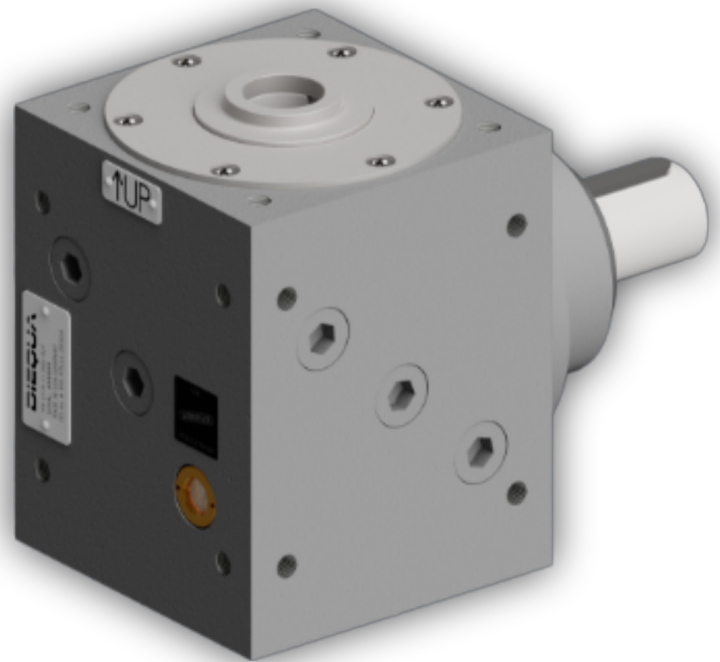
To combat the rigors of high-pressure washdowns, we integrated a Stainless Steel Slinger. This component acts as a physical shield, actively redirecting water away from the critical top seal.

### **3. Maintenance-Free Lubrication**

We eliminated the breather—a common entry point for moisture—by creating a fully sealed housing filled with Food-Grade NSF H1 Synthetic PAO Oil. This design extends the life between service intervals while ensuring strict process purity.

### **4. Superior Washdown Durability**

We applied a high-quality, 2-step primer and a specialized Stainless Steel Gray paint application. This ensures the housing remains corrosion-resistant and easy to sanitize, even in the harshest dairy environments.



## Engineering the Future of Industrial Mixers

High-volume tank processing doesn't have to be synonymous with high maintenance costs. By moving away from off-the-shelf components and turning toward purpose-built engineering, you aren't just fixing a temporary gearbox issue—you are future-proofing your entire production line.

**Transitioning to a Customized Spiral Bevel Gearbox** ensures that noise, vibration, and environmental ingress are no longer the bottlenecks of your facility.



Send your specs to our engineering team ([info@diequa.com](mailto:info@diequa.com)) today to request a quote for your custom gearbox.