

PowerBreather™ Trial Demonstrates >20% Longer Life for Leading Industrial Enzyme Manufacturer



Industry:

Industrial Biosciences

Products:

TTI PowerBreathers, models #TT-1, #TT-3, #TT-4

Applications:

- Gear Boxes
- Hydraulic systems
- Transfer Pumps
- Totes, storage tanks
- Wind turbines

Customer Profile:

An industrial enzyme manufacturer located in eastern Iowa that produces industrial-grade enzymes, both liquid and dry, used in a range of industries including animal nutrition, biomaterials, biofuels, corn milling, detergents, food production, personal care, and textiles.

The Challenge:

As a highly technical and complex process, enzyme manufacturing requires attention to detail to ensure product purity and consistent quality is delivered every time. The production process is fermentation-based, requiring a tiny volume of *inoculum* (bacteria) dispersed in a controlled and optimized medium to support abundant enzyme growth. Specifically, a bacterium (e.g. *Aspergillus niger*) is subjected to a carbohydrate-based medium in tightly controlled conditions (i.e. pH, temperature, oxygen content, nutrient mix) to maximize enzyme production. Once populated, the enzyme is separated from the dead cells and further purified through separation by centrifugation and filtration techniques. This process is capital intensive but, executed efficiently, results in high profit margin. Executed poorly, results include unacceptable product yields, marginal quality, and a marginal business. Success can best be achieved when the operation follows best practices in a well-managed and well-executed preventative maintenance program.

TTI breathers increased service life 20%-25% longer compared to their current solution.

TTI breathers can reduce downtime and unplanned maintenance.

As a cost effective solution TTI can lower overall spend on breathers.

TTI's world class customer support and installation support can help in successful transition to all applications that breathers are used.



TTI breather in application

Routine maintenance is scheduled to reduce the possibility of process interruptions and allow enzyme production equipment to operate smoothly and reliably. Critical to this maintenance is for hydraulic oil reservoirs feeding pumps and gear boxes to be free of moisture and particulate contamination. This is achieved by installing air breather units. They provide negligible resistance to air passage into and out of the fluid reservoirs, while absorbing moisture by means of desiccant. Additionally, a microfiber depth media captures air-borne particulate matter to prevent system contamination.

Desiccant media's uptake of moisture is finite and will vary due to the mass contained and quality differences between grades of desiccants. The subject enzyme producer had been disappointed by short breather life using competitive Size #1, Size #3, and Size #4 breathers. They wanted options allowing for greater moisture capacity and a longer service cycle. And naturally, the solution had to be cost effective as measured by annual spend for this maintenance item.

Testing:

TTI's Application Engineering staff conferred with plant engineering personnel to observe and understand the enzyme manufacturing process. It was determined that TTI could offer cross-reference models of matching size. Several hydraulic systems were included in the comparative testing and this allowed TTI to directly compare TTI models #TT-1, #TT-3, and #TT-4 series against the incumbent's Size #1, Size #3, and Size #4 for a 90 day trial period.

Results:

After the 90-day trial period, it was observed that several of the incumbent units were at or near exhaustion. The TTI PowerBreathers showed considerable remaining absorptive capacity with no units approaching exhaustion. Absorptive capacity and comparative performance is based on the known quantity of moisture that can be taken-up by the desiccant media.

The evaluation team presented the following conclusions:

1. TTI breathers provide a 20%-25% longer service life versus the incumbent series.
2. This extra capacity available allowed the facility to reduce the number of planned maintenance cycles and process interruptions per year.
3. With a lower unit cost in the comparably-sized models, the TTI product further lowered overall spend on breathers.
4. The team supported an immediate conversion to TTI breathers.

TTI is proud to report that their breathers have out-performed competitive units in 100% of side-by-side industrial trials. Please contact your TTI representative for additional details. We welcome the opportunity to accept your trial challenge and prove that TTI offers the best overall product value.

Product Specifications:

Body Materials:

ABS, Nylon, Polypropylene, Buna

Moisture Absorbing Media:

Silica Gel Desiccant

Filter Media:

Polyester, Polyurethane

Filter Efficiency:

3µm Absolute

Operating Temperature Range:

-20°F to 200°F (-29°C to 93°C)

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