

Rubber Fab

a Garlock Hygienic Technologies company

Case Study: Aloe Vera Juice Processing Tuf-Steel® Gaskets



INDUSTRY

Beverage Manufacturing - Aloe Vera Juice

CUSTOMER

A large US beverage manufacturer, producing natural juices at their production plant in Texas.

BACKGROUND

This customer was using standard PTFE tri-clamp gaskets on their hygienic pipe connections, but was facing ongoing problems with gasket failure. In order to avoid severe leaks throughout their process, they were replacing gaskets on a weekly basis which was not only expensive but also time-consuming for the maintenance crews.

CHALLENGES FACED

Production of aloe vera juice is challenging, and requires careful process control – not only to preserve the biological integrity of the active ingredient, but also to maintain the delicate flavour of the finished product. Mechanical extraction processes (crushing, grinding or pressing of the leaf) create debris, which can damage soft process components and requires frequent cleaning and sterilization cycles between each batch. Additionally, various stages of filtration and stabilization introduce rapid temperature fluctuations from near-boiling point down to flash-cooling, which create physical stresses on hygienic connections as they expand and contract.

OPERATING CONDITIONS

1. Size: 1" to 4" Tri-Clamp (ASME-BPE)
2. Temperature: -5°C (23°F) to 95°C (203°F)
3. Application: All hygienic process pipe/vessel connections
4. Media : Raw extract and purified aloe vera juice
5. Pressure: 120 PSI (8.3 bar)

SOLUTION AND BENEFITS

The customer provided full access to the plant and their processing conditions so that Rubber Fab could carry out detailed troubleshooting and recommend the best possible improvements. Taking into account the need for mechanical strength, chemical compatibility, and resilience in temperature cycling conditions, it was recommended that the standard PTFE gaskets were replaced with Tuf-Steel® sanitary gaskets which would not exhibit the creep and cold-flow (and hence leakages) normally associated with PTFE. The unique blend of virgin PTFE and passivated 316L stainless steel provides possibly the most robust gasket material for hygienic applications, which would have no problem to provide a long-lasting and effective seal in these process conditions. Additionally, Rubber Fab's experience in other sensitive food & beverage applications re-assured the customer that these gaskets would not impart any flavour into the juice.

Following a successful trial in one part of the process, Tuf-Steel® was quickly adopted across the whole plant and eliminated all of the leaks that previously caused so many problems. Instead of urgently replacing gaskets on a weekly basis, the customer is now replacing Tuf-Steel® gaskets every 2-3 months as part of scheduled maintenance.

For more information, please visit: www.rubberfab.com