



High-Temperature Composite Expansion Joint Eliminates Repeated Shutdowns at Salt Production Facility



Application:

Holz Rubber Company engineered a custom high-temperature composite expansion joint for a dryer and shaker system operating at a large salt production facility.

Expansion joints used in salt processing operations must absorb continuous thermal expansion, vibration, equipment movement, and process-related stresses while maintaining system reliability. In these demanding environments, traditional metal bellows can be vulnerable to fatigue, media buildup, and premature failure.

For this application, the facility required a more durable expansion joint solution capable of improving reliability, reducing maintenance requirements, and supporting continuous production.

Problem:

A salt production facility was experiencing recurring failures with an 84-inch metal bellows expansion joint installed on its dryer/shaker system. The existing metal expansion joint struggled to absorb the actual operating movements and vibration generated by the process equipment. As a result, the bellows experienced fatigue cracking and repeated deterioration during normal operation. The consequences included:

- Frequent maintenance shutdowns
- Increased labor costs
- Reduced production efficiency
- Emergency field repairs
- Increased risk of unplanned downtime

The facility reported an average service life of approximately nine months, with two to three maintenance shutdowns occurring during that period due to failures in the existing metal bellows design. Plant personnel needed a more reliable expansion joint solution capable of handling the true operating conditions of the system.

Root Cause Analysis:

Holz Rubber Engineering partnered with the distributor and plant management team to conduct a detailed evaluation of the application.

The investigation included:

- Site measurements
- Movement analysis
- Equipment photographs
- Operational videos
- Process condition review

The engineering review revealed that actual extension and compression movements were significantly greater than originally documented. In addition, the metal bellows were directly exposed to process media. Continuous movement combined with material buildup created excessive wear, eventually causing holes to develop in the bellows assembly.

The root causes of failure included:

- Underestimated movement requirements
- Excessive vibration
- Media intrusion



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Solution:

After analyzing the operating environment, Holz Rubber designed a complete high-temperature composite flat belt style expansion joint system engineered specifically for the application.

The upgraded design incorporated:

- High-temperature composite expansion joint construction
- Heavy-duty bolt-in frame assemblies
- Double internal baffles
- Full cavity insulation pillow system
- Media protection features
- Improved flexibility for extension and compression movement

Unlike the previous metal bellows design, the composite expansion joint system was engineered to accommodate the actual movement requirements while protecting the flexible element from damaging process media.

The cavity insulation and internal baffle system helped prevent material buildup and significantly reduced wear on the expansion joint assembly.

Why Composite Expansion Joints Outperform Metal Bellows in Certain Applications:

Industrial dryer systems, salt processing equipment, bulk material handling systems, and shaker applications often experience operating conditions that can shorten the life of traditional metal bellows.

High-temperature composite expansion joints offer several advantages:

- Greater movement capability
- Improved vibration absorption
- Reduced fatigue-related failures
- Better resistance to media intrusion
- Lower maintenance requirements
- Simplified replacement procedures

For applications involving large movements, abrasive materials, and frequent vibration, a properly engineered composite expansion joint can significantly improve system reliability.

Results:

Reduced Maintenance Shutdowns
Improved Production Efficiency
Extended Expansion Joint Service Life
Lower Lifecycle Costs
Improved Equipment Reliability

Holz Rubber Specializes In:

- High-temperature composite expansion joints
- Dryer expansion joints
- Shaker system expansion joints
- Industrial duct expansion joints
- Custom-engineered expansion joint solutions
- Metal bellows replacement projects
- Bulk material handling applications
- Salt processing equipment expansion joints
- Industrial vibration and movement solution

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