

A Metal Bellow is Replaced with a Molded Flange High Temperature Composite Expansion Joint

Application:

Lime Kiln Dryer Process Air fan connector at Pulp and Paper Mill.

A lime kiln is used to convert calcium carbonate CaCO_3 into burnt lime CaO . The burned lime reacts with the green liquor and precipitates as CaCO_3 , thus creating a closed loop with the re-causticizing.



Problem:

The Paper mill noticed a ten + year-old metal bellow had failed. They replaced the existing bellow with the same design. Three months after replacement, the joint failed again, showing stress cracks at the welds, where the bellows meet the flat. The movements are too great for the mitered and welded seams of the metal bellow. This plant system requires seven days a week operation for 12-18 months continuously. The unexpected failure and downtime left the mill open to exploring a non-metallic expansion joint viable option.

Solution:

Our Engineers reviewed the system specifications and pictures provided by our Distributor of the application, including the failed metal bellow. Based on the system movements, operating temperature, and media, our engineers recommended a Molded Flange Single Layer Composite PTFE/Fiberglass expansion joint incorporating 1/2" Radius corners for strength and stability during operation. We also designed a metal flow liner to fit inside and protect the High Temp Expansion Joint material from abrasion. The new design replaced the existing failed metal bellow, bolting to existing flanges with no need for additional frames or onsite fabrication. The light weight of the High-Temp Joint saved time and money compared to installing a metal bellow.