

CRYO PLANT DEALS WITH DIFFERENTIAL PRESSURE BUILD



Pentair dust filters for removing desiccant fines and solid contaminants upstream of the cryogenic plant



Inside of a dust filter



Left shows a sample of the desiccant fines upstream of the dust filters. Right shows a sample of the solid contaminant that was captured using a boroscope while on-site at the facility.

A gas processing facility in Western Colorado was having challenges with building differential pressure across a cold box heat exchanger on the inlet to their cryogenic plant. The plant processes 450 MMSCFD of gas through a dehydration unit prior to feeding their cryo plant. The plant utilizes Pentair separation equipment to remove desiccant fines downstream of a molecular sieve. The plant contacted Pentair field services when they started to see appreciable differential pressure building on their cold box. Pentair field services were on-site to complete a plant survey and troubleshoot the process in order to determine the cause of the fouling.

Pentair Field Services along with plant personnel conducted a thorough inspection of the dust filter. The inspection included review of vessel preparation and commissioning procedures. The inspection revealed that the presence of liquid and solid contaminant on the downstream side of the vessel. Samples on the downstream side were captured using a boroscope submitted to Star Laboratories. Since this material was downstream of the filter it was not clear whether the contaminant was passing through the filter or if it had been introduced from another source. Pentair's Star Laboratories used our SEM or scanning electron microscope to identify the elemental composition of the contaminants downstream of the dust filter as depicted.

The analysis revealed that the contaminant in question was made up of desiccant fines less than 0.4 micron in diameter that had been agglomerated into a paste with hydrocarbon present on the downstream side of the vessel.

As a result of the field visit Pentair and the plant have done the following:

- Pentair worked with the plant to revise their vessel preparation procedure to prevent liquid from getting into the vessel as it would appear the presence of hydrocarbon and submicron particulates is causing the differential pressure on the cold box heat exchanger.
- Pentair also conducted training for the plant's operations and maintenance crews for changing out elements to assure a positive seal is maintained.
- Prior to leaving the site we conducted online gravimetric testing downstream of the dust filter to assure that there were no solids carrying over downstream of the dust filter.

Upon completion of our inspection and recommendations, the plant has not experienced heat exchanger fouling. We continue to keep in close contact with the plant regarding element change out and differential pressure monitoring.