



CASE STUDY

Nitrous gas piping

One of the world's largest producers of ammonium nitrate (AN) and nitric acid (NA) regularly had challenges achieving a long-lasting seal on an uninsulated Thermowell instrument flange joint (cold spot) in an otherwise insulated piping adjacent to gas compression. The sealing failure of the previously installed tanged sheet gasket causing NOx leaks necessitated unplanned maintenance intervention seven times in three and a half years.

INDUSTRY CHALLENGES

Elevated temperatures, corrosive environments, and vibrations may be challenging for semi-metallic gasket technologies. Before the utilization of the DeltaV-Seal[™], the previous tanged sheet gaskets required seven unplanned maintenance interventions in three and half years. Ensuring a reliable seal at elevated temperatures, corrosive piping contents, and vibrations from nearby compressors can be a challenge for legacy gasket technologies, while the DeltaV-Seal[™] has proven itself capable of working effectively under these plant operational conditions.

BACKGROUND

A traditional tanged sheet gasket was used to seal an uninsulated Thermowell instrument flange joint (cold spot) in an otherwise insulated piping adjacent to gas compression, causing leakage in a gasketed flange joint. The piping contained nitrous gases and was therefore monitored for fugitive emissions of NO_x (NO + NO₂) and for pollution in the vent stack. As the Thermowell instrument was installed adjacent to a gas compressor, the pipework was monitored for vibrations during the plant's operation. The operational conditions at the flange joint led to frequent shutdowns and the need to replace the gasket.

PIPEOTECH

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Material

316L Stainless Steel

Industry

Fertilizer

Customer

Global Fertilizer Manufacturer



BENEFITS

The DeltaV-Seal[™] is proven as gas-tight, minimizing fugitive emissions of NO, under challenging piping operational conditions. Being manufactured in materials compatible with the piping and pipe contents, the DeltaV-Seal[™] will not be subject to mechanical and chemical degradation as found with semi-metallic gaskets. With the proven vibration, chemical and pressure pulse resistance, the DeltaV-Seal[™] has maintained a gastight seal, improving the fertiliser plant's reliability. The regular and unplanned maintenance interventions are now prevented by switching from tanged sheet gaskets to the DeltaV-Seal.



PREVENT FUGITIVE EMISSIONS



AVOID SHUTDOWNS



INSTALL AND FORGET



OPERATIONAL CONDITIONS

PRESSURE: 9.3 BarG (135 psi)

ATMOSPHERIC CONDITIONS: Outdoor

TEMPERATURE: 141°C (286°F)

MEDIA (PRODUCT): Nitrous Gases

SIZE: DN 40 (1 1/2")



Pipeotech's 316L stainless steel gasket is perfect for nitrous gas piping at elevated temperatures, under piping vibrations and in corrosive conditions. The DeltaV-Seal[™] gasket is fully metallic, providing the tight and durable metal-to-metal seal that the client required without any special considerations beyond those of traditional semi-metallic gaskets and within the installation parameters of ASME PPC-1 and Pipeotech's installation instructions. As the gasket is fully metallic, it removes the need for filler material, thereby preventing degradation over time. Furthermore, the gasket has been tested and proven resistant to pressure and vibration cycles.

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