

Piston and Rider Runtime Improvement in Crude Nitrogen Compressor

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The Challenge

This customer operates two non-lubricated Mitsui compressors compressing crude Nitrogen (i.e. contains oxygen). Piston and rider ring lives have historically been known to be below 4000 hours but with a competitor's impregnated resin material grade (their primary bone dry nitrogen material), they achieved 4800 hours. However, that specific grade of material became obsolete and when trying other grades of material they struggled to achieve even half of the life they used to get. This is a challenging application because the liners are Ni-resist and there is a chance of catalyst dust formation (aluminum oxide) in the cylinder.

The crude Nitrogen must be approached differently to pure nitrogen. The fact that the gas contains oxygen provides a totally different tribological challenge in terms of achieving successful lifetimes. CPI, part of the Howden group, has developed specific special polymer alloy grades for both of these applications.

The Solution

Based on the results of the two previous installations, CPI installed CPI 114 rings, a material developed specifically for dry gasses containing oxygen, on one machine and those rings achieved a lifetime of around 6000 hours. With that success the customer has continued to use CPI rings on the other machines.

