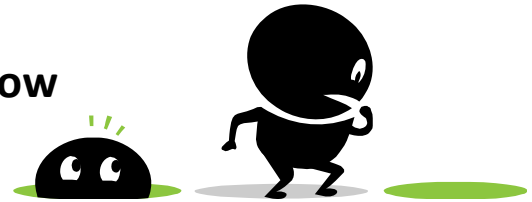


## Hidden Corrosion under Insulation: How Removable Insulation Can Help



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As everyone knows, building the massive Petrochemical facilities in Western Canada cost millions upon millions of dollars. But what is often overlooked are the costs associated with the daily operation, maintenance and upgrading of facilities after they make “First Oil or Gas”. To make these facilities more efficient and to increase production, facility owners are increasing through-volume, operating pressures and temperatures. At the same time they are battling to keep the operating costs down while working with aging infrastructure at these ever changing facilities.



Recently I attended a course in Calgary at *ACM Facility Safety* (Canada's largest independent provider of Hazard Analysis, Safeguard and Risk Assessment services). It was an interesting class attended by a number of different individuals ranging from facility engineers, insurance risk specialists, and a number of administrative and plant operations representatives from well-known companies in the Oil and Gas industry.

One of the topics discussed was a course offered by ACM called “*HAZOP Assessment*”. We touched on how plant changes affect the operation of the plant and processes. One cannot help but think about the design specification of facilities and how we sometimes push our facilities to their maximum design

limits. It is one thing to push a facility to the maximum design limits when it is 6 months old and yet another to push it hard when it is 30 years old.

Many factors can reduce the operational life of an aging plant's piping, equipment and systems. One of these factors is corrosion under insulation. The caustic and corrosive nature of the materials flowing through the plant makes constant maintenance and equipment replacement essential. How do we find a balance between ruptured lines and vessels and replacing corroded equipment and lines too soon? The answer is testing and monitoring to confirm the ongoing integrity of the unit's systems and piping within the facilities.

Permanent or hard insulation can pose a challenge when it comes to monitoring for corrosion under insulation, as this insulation must be removed and later replaced, entailing time, effort, and expense. Companies may opt for the 'easy way out' by looking at the piping sections on either side of a hard insulated section or line and making a judgement or guess based on the piping up and downstream from that section.

Companies with a more long term view will opt to remove permanent insulation for testing; often times, however, this insulation is never replaced. This is why so many companies use removable re-usable soft cover insulation in today's petrochemical facilities. By having the ability to easily remove and reinstall the thermal covers you gain direct access to critical piping surfaces. One can see the condition of the coatings, and by the use of modern non-destructive testing methods, calculate the loss of wall thickness and structural integrity due to corrosion.



In the January 2013 issue of NACE International (National Association of Corrosion Engineers) there is an excellent article on the effects of corrosion under insulation. What might be even more interesting is the thermal loss of some

types of insulation when exposed to moisture and condensation.  
<http://mp.epubxp.com/i/100649>

At Firwin we strive to make sure our thermal removable covers fit snugly around the pipes, flanges and valves we cover. A cover that fits poorly does not repel moisture away from the covered surface, and a cover that does not close properly can sometimes do more harm than good. We will discuss these issues in our next newsletter when we discuss the various types of insulation materials and their thermal characteristics when wet.



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