

What is Corrosion Under Insulation?

In its simplest term, Corrosion Under Insulation (CUI) is defined as follows: -

“Any type of corrosion occurring due to moisture build up on external surface of insulated equipment.”

Types of corrosion can be galvanic, chloride, acidic or alkaline corrosion. If CUI is undetected, results can lead to shutdown of a process unit or an entire plant. In some cases, it may lead to process safety incidents which can include fire, explosion or even toxic releases.

E.g. Oleum release Incident at DuPont’s Belle Plant in 2010.



Corrosion under insulation found on pipe. Courtesy:
<https://www.alsglobal.com/myals/news/2017/06/asset-care-counts---corrosion-under-insulation>

How it happened?

Water ingress into an insulation layer will react with the metal surface in the presence of oxygen, causing pitting. If there is no early detection, the pitting will be aggravated with pits getting deeper. Eventually, the release of substance within the containment will occur.

Water ingress into insulation is often due to the following: -

- Poorly designed and/or installed protective finish or cladding
- Cladding joint sealant breakdown
- Mechanical damage of cladding material

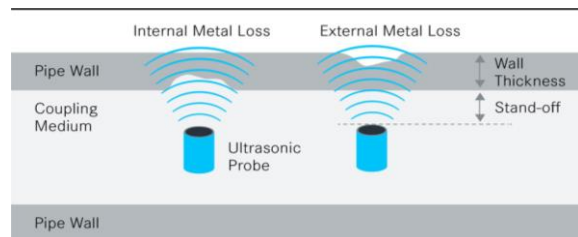


Detrimental effects on CUI. Courtesy:
<https://www.eddyfi.com/oil-gas/corrosion-under-insulation-plague-what-you-need-to-know/>

What can you do?

To ensure CUI is prevented, there are several factors to be considered: -

- Insulation selection – material, etc
- Weather barriers
- Having good maintenance inspection regime
- Good installation and design



Metal loss inspection – principle:-
<https://www.ndt-global.com/about/our-technology/ut-corrosion-inspection-technology>

References

1. Oleum Release Incident
(<https://www.csb.gov/assets/1/20/csb%20final%20report.pdf?13966>)
2. <https://www.nationalboard.org/Index.aspx?pageID=184>
3. <https://www.ndt-global.com/about/our-technology>

Process Safety is Everybody’s Responsibility!

An initiative of the Process & Engineering Committee

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