

THIN CHANNEL CORROSION FLOW CELL (TCFC)

TECHNOLOGY OVERVIEW

The technology facilitates a convenient and accurate system for in situ observation of a corrosion process in a single phase flow. The method is based on the flow dynamics between two parallel flat plates, and provides a mechanism to study corrosion in flowing systems. It eliminates the effect of centrifugal force encountered in the rotating cylinder electrode system, which is currently the most used method for small scale analysis of flowing systems. TCFC is ideal for the study of initiation and propagation of localized corrosion, providing an easy method to control and observe the mechanical and chemical effects on corrosion product films. It can be coupled with multiple measurement techniques such as electrical resistance, linear polarization resistance, weight loss and quartz crystal microbalance to provide in situ information of a corrosion process.



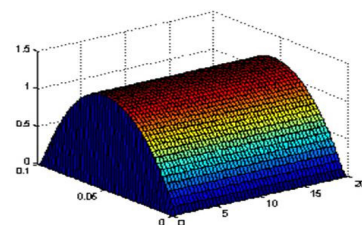
POTENTIAL FIELDS OF USE

TCFC provides a solution to observe and monitor internal corrosion in oil and gas production, and transportation facilities. Corrosion is a major factor for degradation in the life-span of metallic and non-metallic fluid carrying pipes. Latest market studies by CCTechnologies show the increasing cost of corrosion in the Energy and Petroleum (E&P) sector. On an annual basis, direct corrosion costs incurred by the US exceed \$1.4 billion in oil and gas exploration and production, 3.7 billion in petroleum refining, \$7.0 billion in gas and liquid transmission pipelines, and \$5.0 billion in gas distribution. In addition to this, more than \$100 million is spent by oil corporations and environmental agencies to combat the effects of oil spills due to corroded pipes.

BENEFIT ANALYSIS

TCFC provides a superior mechanism for studying corrosion effects in flowing systems:

- Reduces the cost of operation as compared to large scale equipment used to observe corrosion.
- Facilitates the comparison of the system with pipe flow as flow conditions of thin channels are well known.
- Facilitates a given analysis through several parameters such as controlling the temperature, volumetric flow rate, and pressure inside the channel flow cell.
- Enhances the accurate measurement of corrosion process in a channel using a wide range of measurement devices and techniques.



STAGE OF DEVELOPMENT

The technology is at advanced stage of development, having successfully formulated a quantitative tool to measure various parameters required to compute corrosion in a flowing system. The hydraulic diameter of a duct is used to assess the flow through it. 3D analysis tools have been used to verify test results.

FUTURE DEVELOPMENT

The method can be customized to analyze a particular kind of flow without compromising on the quality and efficiency of the analysis.

LICENSING OPPORTUNITIES

A PCT for this technology has been filed. Licensing opportunities are available.