

# Corrosion Slowed On Tank Bottoms

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## Vapor Corrosion Inhibitors Used To Mitigate Corrosion Rate Of A Double-Tank Interstitial Space

**P**raxair Services, Inc. has an emergent solution to a major challenge confronting many owner/operators of above-ground storage tanks (ASTs).

The challenge is control of tank bottom corrosion on the underside of a double-bottom tank upper floor and on a single-bottom tank with an HDPE secondary containment liner. The retrofit installation of cathodic protection systems for these ASTs is not typically practical. A logical and economical solution for control of floor plate corrosion within the interstitial spaces of these tanks is vapor corrosion inhibitor (VCI) technology.

Field data from actual VCI installations is encouraging. This update provides information related to:

- The installation of the Praxair Services Bottom Logic<sup>SM</sup> Corrosion Inhibitor solution in a 120-foot diameter tank was performed in December 2004,
- Recent data from 17 ASTs located in the **southeastern US.** that had corrosion inhibitor delivered into the interstitial space during 2000-2001.

*Praxair Services 120-foot Diameter Tank Project.* The tank had two steel floors separated by about four inches. An HDPE liner had been installed on top of the lower floor, then the interstitial space between floors was filled with sand. The VCI was delivered into the tank's interstitial space on Dec. 16, 2004.

Site Visit No. 1: Tasks completed prior to installation of corrosion inhibitor. Electrical resistance corrosion rate probes

were used to **provide** real-time calculated corrosion rate measurements of the double-bottom tank interstitial space environment. They yield a corrosion rate described in mils per year metal loss. These probes are installed at numerous locations between the tank floors. They are used to establish the corrosion rate of the interstitial space metals prior to installation of the inhibitor.

Once the inhibitor has been effectively delivered throughout the interstitial space, the probes are monitored until the inhibitor has achieved equilibrium in the interstitial space and a lower corrosion rate is established. Corrosion rate measurements are then obtained periodically to monitor the continual effectiveness of the VCI.

*Determine Existing Telltale Pipe Configurations.* This 120-foot diameter tank had 13 existing 1-inch diameter perforated telltale pipes installed at varying distances into the interstitial space. A rod was pushed into each existing port to determine the undertank length of the telltale pipe. The distance between ports was about 29 feet. (Figure 1)

*Install Four Access Ports for Corrosion Rate Probes into the Interstice Between the Upper and Lower Floors.* Four additional ports through the tank shell were necessary for placement of corrosion rate probes into the interstitial

space. These were located between the telltale pipe ports as indicated on the plan view shown. Praxair Services has developed a special procedure for the safe installation of threaded ports in the tank shell without compromising internal HDPE liner integrity.

*Installation of Corrosion Rate Probes into the Interstitial Space.* The corrosion rate probes were installed and first read on Dec. 3, 2004. They were installed directly through the tank shell and into the sand a



