

Global EcoTechnologies, inc.

TECHNICAL REPORT: ECOSYSTEM® TECHNOLOGY FOR EXPANDED POLYURETHANE FILMS VS LESSER SOLID POLYURETHANE FILMS

BACKGROUND:

The technology known as Ecosystem® for expanded polyurethane films is specified widely by Asset Owners and Consulting Engineers and has been in service for over 30 years in industrial and commercial applications, including water and waste water treatment processes. The key performance element to this application technology is the ability to produce a closed cell film that while flexible offers unique barrier qualities. Each of the closed cells is filled with inert gas that enhances the barrier quality of the film. In order for perm to penetrate the film it must go around the cells creating a longer path to substrate. This is similar to how glass flake filled coatings provide enhanced barrier properties. The technology was developed in the late 1980s for direct to earth application of elastomeric polyurethane, in secondary containment for the Petro-Chemical industry. Later it began to be

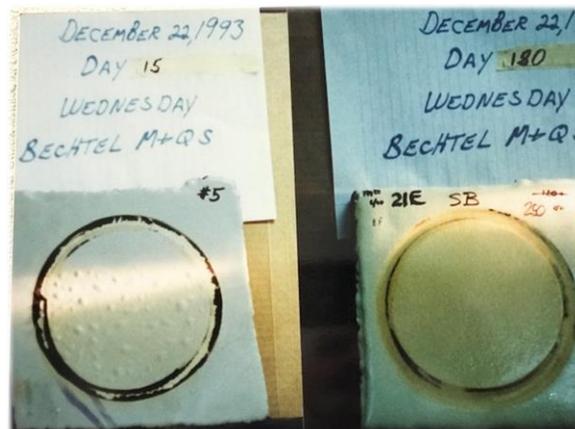


used as a way to line highly deteriorated concrete vessels exhibiting high profile exposed aggregate. The result is a pinhole free lining system without the need for hand troweled surfacing compounds like high and early grout. This process works great on severely pitted steel like old riveted pipe or back to back, non-welded steel structures. This process, which typically included 200 mils of expanded polyurethane base with a 50-mil solid film cap, became a cost-effective way to do concrete restoration work. Later in the early 1990s, Pacific Gas and Electric Company commissioned Bechtel MQS in San Francisco to test a number of coating systems under a NACE procedure known as NACE

Standard TM-01-74, also known as Atlas Cell Test procedure A. Essentially this test is a forced failure of a polymer film on metal substrate. The sample is exposed to 150F deionized water in an environment where forced permeation of the DI water through the film to substrate is created. All of the solid films failed within 1-2 weeks. The expanded polyurethane film went 18 months without blistering or delamination before the test was terminated, proof of its superior performance over solid film.

SOLID FILMS ARE NOT EQUAL TO EXPANDED FILMS:

There are those that would submit that 150-mil solid film application is equal to the Ecosystem® 250 mil expanded / solid film application. This is not correct. Aside from a 40% less overall film deposition, the 150-mil solid film does not have the same permeation resistance as the 200-mil expanded plus 50 mil solid application. In addition, the application of this much solid film over a porous substrate like concrete will produce pinholes as the hot liquid polyurethane traps and heats air behind the film which will result in costly repairs. The Ecosystem® application technology offers enhanced permeation resistance from the expanded film, enhanced impact and abrasion resistance from the solid film, and the ability to encapsulate exposed aggregate and eliminate pinholes.



ECOSYSTEM® VS SOLID FILM