

## Bonded Corrosion Protection Pipe Coatings: Synergy® versus Entec®

### Multi-layer Coating Systems:

For decades it has been recognized that pipeline corrosion control can be attained by using coating systems (with CP) that can electrically insulate, be installed without coating damage, and remain integral over time. However, there is no single material that easily meets all of those requirements. The emergence of multi-layer systems was intended to solve the deficiencies of any one monolithic material layer by bringing the various strengths of multiple material layers to bear. Two of the multilayer coatings that have been tested by decades of field installation and performance are Synergy® and Entec®.

### Entec® Asphaltic Mastic + PE Layer:



Entec® is a two-layer system which utilizes an asphaltic mastic layer on a prepared pipe surface and then incorporates a plant-extruded top layer of polyethylene (PE) for protection against handling and installation damage. The asphaltic mastic layer and top PE layer are extruded onto the pipe separately and do not have the high level of adhesion of other multi-layer systems, such as Pritec® and Synergy® (see Peel Force on next page). The PE layer has been known to slide away from the mastic layer during handling and installation.<sup>1</sup>

Figure 1: Entec® by Bredero Shaw

### Synergy® Three-Layer Fused Coating:

Like Pritec®, Synergy® starts with a butyl rubber layer, or primer, which provides optimal adhesion to the pipe substrate, and a PE top layer for mechanical protection. However, sandwiched between the butyl rubber and the PE top layer is another polymer layer that provides additional chemical bonding between the layers. All three layers are applied to a heated pipe allowing for the resultant heat-soak to fuse the layers into a cohesive system. The polymer layers are factory quality controlled (ISO 9002) and sent to the applicator only after passing plant QA/QC requirements. Synergy® has been used for over 22 years in a variety of oil & gas as well as water pipeline applications.

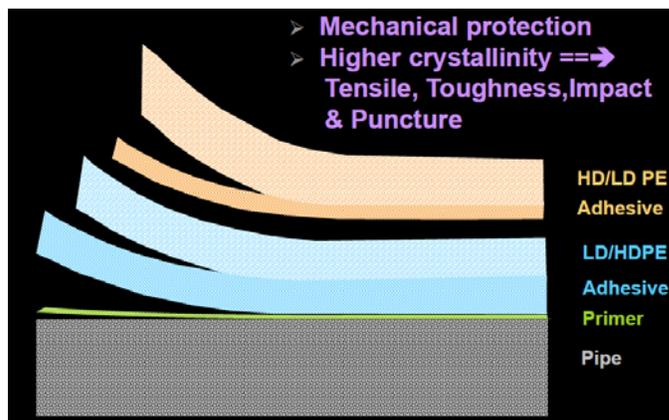


Figure 2: Synergy® by Berry Plastics

## Physical Property Comparison:

Test/Characteristic	SYNERGY®	ENTEC®
Thickness	50 mils	40 mils
Cathodic Disbondment <sup>1</sup>	6mm, 14mm	12mm, 24mm
Cathodic Disbondment <sup>2</sup>	40mm	total
Impact Resistance <sup>3</sup> (in-lb)	45	22
Penetration Resistance <sup>4</sup> (%)	11	23
Peel Force <sup>5</sup> (lb/in)	45	12
Soil Stress Resistance (rating)	13.5	6.5

\*Berry Plastics test data

1. ASTM G-8: 30 day, 90 day – mm radius
2. ASTM G-42
3. ASTM G-14 @70°F
4. ASTM G-17
5. ASTM D-1000

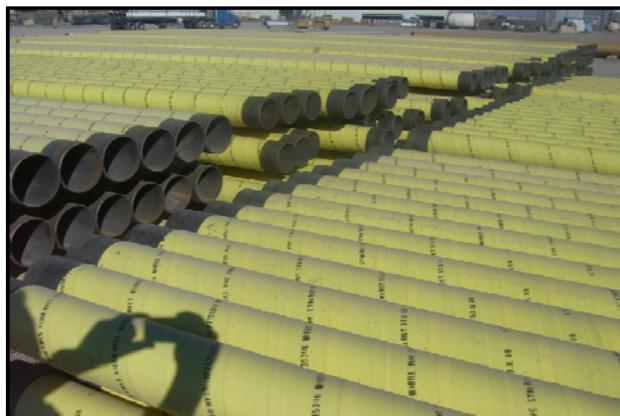


Figure 3: 8" Synergy® Gas Pipe at Mobile Pipe

## Conclusion:

Multi layer coatings like Synergy® and Entec® for corrosion protection of pipe systems offer a strong combination of experience, economic feasibility, and technical capability. Naturally, one of the most important aspects of coating effectiveness is the choice of applicator. Experience with the coating, reputation, reliability, and presence of a quality control system are important considerations.

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