Bentonite Composite Waterproofing System

Free-standing Poured Walls
Bento-Pro Ultra rolls are installed either vertically or horizontally by nailing across the top every 20" (0.51m) minimum, lapping seam edges 1-1/2" (3.8cm) and nailing vertical seam edges every 3' (0.9m) minimum with washer head masonry nails. Seal all overlap edges with Bento-Pro Seam Tape or Ecoline S or T. Pour a 1-1/2" (3.8cm) course at juncture of wall and footing using EPRO Bento-Pro Granular or Ecoline T prior to roll application. Install insulation and compact backfill to minimum 85% Modified Proctor. A protection course is not required for most applications. For special applications, contact EPRO for details.

Blind-Side (Soldier Beam & Lagging or Shot-Crete)
Bento-Pro Ultra rolls are installed either vertically or horizontally. For poured concrete, lap joints 3" (7.6cm) shingle fashion (top over bottom). For shotcrete, lap joints 4" (10.2cm) reverse shingle fashion (bottom over top). Nail or box staple all overlap seams at 4" (10.2cm) O.C. Detail all tiebacks & penetrations with Epro Ecoline S (spray) or Ecoline T (trowel) as recommended by EPRO.

Under Structural Slab, Split Slab
Install over prepare sub-grade compacted to 85% Modified Proctor or mud slab. Roll out membrane over installed HDPE layer or mud slab. Overlap and stagger seams minimum 3" (7.6 cm). Fasten seams with box staples. For all penetrations and moisture/gas vapor barrier, detail penetrations and seams with Ecoline S (spray) or R (roller) as recommended by EPRO. For split slab construction, slab thickness shall be 4" (10.2 cm) minimum. Protect area from flooding prior to concrete pour.

Packaging
Roll size is 3.5' x 14.3' (1.1m x 4.4m) or 50 sq. ft. (4.6 m²). Custom size rolls are available by special order. Contact EPRO for details.

Product Description
Bento-Pro Ultra is a multi-layer sheet waterproofing system consisting of a self-sealing, expandable layer of granular bentonite laminated to each side of an impermeable high density polyethylene film with a protective layer of non-woven polypropylene laminated to the bentonite layers. This multi-layer composite forms high performance waterproofing system that is tough, self-sealing, vapor impermeable and able to withstand inclement weather, hydrostatic conditions and other factors encountered in today’s construction environment.

Basic Uses
Bento-Pro Ultra is highly effective when waterproofing insulated below-grade free-standing walls, under slabs, tunnels, elevator pits and blindside applications including lagging, caissons, sheet pile and shot-crete retention systems. Applications include most all below-grade concrete structures requiring a high performance waterproofing system that protects against water intrusion from hydrostatic head, gas and vapor intrusion and is able to resist damage during construction from inclement weather and extreme construction techniques.

Installation
For complete installation guidelines, please contact EPRO, ask your EPRO technical representative or visit our website for details.

Preparatory Work
Examine all surfaces prior to application. Remove all debris, standing water, nails and other sharp protrusions over 1/4" (6.4 mm). On free-standing walls, fill voids and/or honeycomb areas with EPRO Ecoline T. For blind-side applications, fill all voids in lagging larger than 1" (2.5 cm) with grout or cover with plywood prior to installation. EPRO EcoDrain is recommended for covering large areas of voids and/or irregular surfaces on blind-side applications.
## Storage
Protect from moisture and rainfall. Store on skid or pallet and cover with tarp.

## Availability
Available world-wide through EPRO Distributors. Contact EPRO at 800-882-1896 or www.eproserv.com for details.

## Limitations
Bento-Pro Ultra is resistant to many common contaminants found in soil and water. Contact EPRO for soil and water compatibility testing. Bento-Pro Plus requires a minimum compaction or confinement of 24 psf to perform effectively.

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### Typical Physical Properties

<table>
<thead>
<tr>
<th>Physical Property</th>
<th>Test Method</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Membrane</td>
<td></td>
<td>20 mil Virgin Resin HDPE</td>
</tr>
<tr>
<td>Bentonite</td>
<td></td>
<td>Wyoming Sodium Montmorillonite (High Swell Type)</td>
</tr>
<tr>
<td>Geotextile</td>
<td></td>
<td>Non-Woven Polypropylene (available in 1/2 oz., 3 oz., and 6 oz.)</td>
</tr>
<tr>
<td>Weight</td>
<td></td>
<td>1.5 lb. per sq. ft. (7.34 kg/m²)</td>
</tr>
<tr>
<td>Puncture Resistance</td>
<td>ASTM E 154-88</td>
<td>172 lb. (77.5 kg)</td>
</tr>
<tr>
<td>Membrane Tensile Strength</td>
<td>ASTM D638</td>
<td>MD: 3670 psi (31.3 MPa)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>TD: 3500 psi (29.9 MPa)</td>
</tr>
<tr>
<td>% Elongation at Break</td>
<td>ASTM D638</td>
<td>&gt;700%</td>
</tr>
<tr>
<td>Peel Adhesion of Geotextile</td>
<td>ASTM C 836</td>
<td>28 lb/in</td>
</tr>
<tr>
<td>Resistance to Hydrostatic Head</td>
<td>ASTM D 5385</td>
<td>100 psi max. Pressure (231 ft. water)</td>
</tr>
<tr>
<td>Permeability</td>
<td>ASTM E96-80</td>
<td>0.024 Perms (grains/ft² hr in HG)</td>
</tr>
<tr>
<td>Resistance to Microorganisms</td>
<td>ASTM E 154-88-13</td>
<td>Unaffected</td>
</tr>
<tr>
<td>Non Toxic</td>
<td></td>
<td>Do Not Ingest</td>
</tr>
<tr>
<td>Freeze Thaw Cycles</td>
<td></td>
<td>No effect before or after Installation</td>
</tr>
<tr>
<td>Chemical Resistance</td>
<td></td>
<td>Extremely High. Contact EPRO for specific Information.</td>
</tr>
<tr>
<td>Life Expectancy</td>
<td></td>
<td>Bentonite &amp; HDPE measurable in the thousands of years.</td>
</tr>
<tr>
<td>Installation Temperatures</td>
<td></td>
<td>-25°F to 150°F (-31.7°C to 54.4°C)</td>
</tr>
</tbody>
</table>

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