



# WATERPROOFING

## MiraCLAY® EF

### Description

CCW MiraCLAY EF has a uniform layer of sodium bentonite clay that is sandwiched between a durable puncture-resistant nonwoven polypropylene fabric and a high-tensile strength woven polypropylene fabric and then needle punched together with thousands of high-strength denier yarns. These fibers are then thermally fused to the polypropylene in a proprietary Infrabond™ procedure that locks the sodium bentonite into place.

MiraCLAY EF is designed for waterproofing below- grade structural slabs as well as construction methods incorporating lagging, concrete caisson or shotcrete retention walls. MiraCLAY EF is also very effective in rehab waterproofing and zero clearance property line construction.

### Features and Benefits

- MiraCLAY EF is used where ground water is contaminated with either salt, chemicals or other foreign substances, as determined by a site water analysis, which can keep CCW MiraCLAY from hydrating.
- MiraCLAY EF waterproofing membrane has the ability to heal itself if ripped or punctured.
- In a hydrated state, the bentonite clay has tremendous impermeability and excellent resistance to chemicals (i.e., acids, bases and hydrocarbons).
- MiraCLAY EF has the ability to expand and seal minor cracks in concrete up to 1/16" in width.

### Installation

#### Underslab Applications

MiraCLAY EF is designed for use under reinforced concrete slabs 4" (100 mm) thick or greater on a compacted earth/gravel substrate. If installed over a mud slab, MiraCLAY EF requires a minimum 5" (150 mm) thick reinforced concrete slab.

When hydrostatic conditions exist, MiraCLAY EF should be installed under footings and grade beams as shown in MiraCLAY EF details.

**Substrate Preparation:** NOTE: Do not begin construction in work areas where there is standing water or in situations which may cause the MiraCLAY EF to prematurely hydrate.

Before installing MiraCLAY EF, the substrate must be properly prepared. Substrate may be concrete, earth, sand, pea gravel or crushed stone. Earth and sand substrates should be compacted to a minimum 85% Modified Proctor density. Crushed stone should not be larger than 3/4" (18 mm) in size. Substrate should be smooth and uniform without sharp projections or pockets. Complete all required elevator pit, sump pit and

grade beam and piling work before installing MiraCLAY EF under main slab area.

**Installation:** Install MiraCLAY EF over the properly prepared substrate with the non-woven geotextile side up. Overlap adjoining edges a minimum of 4" (100 mm), stagger sheet ends a minimum of 24" (600 mm), and nail or staple edges together as required to prevent any displacement during concrete placement. CCW MiraCLAY Granules may also be placed in the seam for additional waterproofing performance.

When the slab is poured in sections, MiraCLAY EF should extend a minimum 12" (300 mm) beyond the slab edge. When the installation reaches the outer edge of the slab, continue MiraCLAY EF up and out of the form a minimum of 12" (300 mm). At the corner, MiraCLAY EF should remain in contact with the substrate and inside the surface of the concrete form. When the form is removed, the MiraCLAY EF outside the form should be positioned and fastened onto the footing or vertical wall. Overlay the MiraCLAY EF a minimum of 6" (150 mm) with the succeeding vertical waterproofing membrane.

At property line retaining walls, such as soldier pile or lagging, continue the underslab MiraCLAY EF application up the retaining wall a minimum 12" (300 mm) above the top edge of the slab or footing and secure. Overlap the vertical MiraCLAY EF waterproofing membrane by a minimum of 6" (150 mm) or a minimum of 12" (300 mm) under hydrostatic head conditions.

#### Property Line Or Lagging

**Substrate Preparation:** Gaps between the wood lagging greater than 1" (25 mm) must be filled with cementitious grout. In areas with large gaps (1" to 5" / 25 mm to 125 mm) between lagging, install plywood to provide a uniform substrate. Where drainage issues may arise, install CCW MiraDRAIN® to provide a uniform substrate as well as to facilitate drainage.

**Installation:** Install MiraCLAY EF with the non-woven side facing the installer. Secure the MiraCLAY EF into position with fasteners and 1" (25 mm) washers. Use the appropriate fasteners for the type of substrate used to receive the MiraCLAY EF. Install succeeding courses of MiraCLAY EF by overlapping the previous course a minimum of 4" (100 mm). Stagger the seams a minimum of 24" (600 mm). Install in shingle fashion so that the upper roll of MiraCLAY EF overlaps the lower roll. Fasten membrane once every 18" (45 cm) on seams or as required to prevent blousing.

At grade line, after the wall has been poured, terminate MiraCLAY EF with a rigid termination bar or fasten 12" (300 mm) on center. Embed the top edge of MiraCLAY EF and termination bar with a thick bead of CCW MiraCLAY Sealant 2" (50 mm) wide by 1/2" (12 mm) thick.

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### Standard Foundation Walls

**Substrate Preparation:** The substrate must be properly prepared to receive the MiraCLAY EF waterproofing membrane. All honeycombs, form-tie cavities and indentations should be filled with CCW MiraCLAY Sealant or filled with latex Portland Cement. Substrate must be smooth and uniform removing any protrusions over ½" (12 mm) from the surface. Footings must be free of soil, rocks or debris to provide a suitable substrate to receive the MiraCLAY EF waterproofing membrane.

**Installation:** The MiraCLAY EF waterproofing membrane should be installed with the non-woven side facing the applicator. Create a cant at any vertical to horizontal transition by applying a 1½" (39 mm) to 2" (50 mm) of CCW MiraCLAY Granules along that junction. At the base of the foundation wall where the vertical wall meets the horizontal footing, install MiraCLAY EF in a horizontal manner extending out onto the footing a minimum of 12" (300 mm). Fasten the MiraCLAY EF in place with concrete fasteners and 1" (25 mm) washers. Install succeeding courses of MiraCLAY EF by overlapping the previous course a minimum of 4" (100 mm). Stagger the seams a minimum of 24" (61 cm). Install in shingle fashion so that the upper roll of MiraCLAY EF overlaps the lower roll. Fasten membrane once every 18" (45 cm) on seams or as required to prevent blousing. At grade line, terminate MiraCLAY EF with a rigid termination bar or fasten 12" (300 mm) on center. Embed the top edge of MiraCLAY EF and termination bar with a thick bead of CCW MiraCLAY Sealant 2" (50 mm) wide by ½" (12 mm) thick.

### Packaging

Available in 5 ft x 14 ft (70 sq ft) rolls

### Detail Requirements

For standard installation details, follow the MiraCLAY details drawings. For non-standard installation instructions contact your local Carlisle Coatings & Waterproofing representative.

### Recommendations

Carlisle Coatings & Waterproofing recommends the use of CCW MiraDRAIN, a geocomposite sheet drain, to facilitate the removal of water away from the structure. The MiraCLAY EF and CCW MiraDRAIN waterproofing and drainage system provides maximum protection against water penetration.

### Warnings and Hazards

- MiraCLAY membranes should remain dry before and during installation.
- Improper storage could lead to product deterioration.
- Not for use on CMU foundations.

### Typical Properties

Property	Method	Unit	Typical Value
Thickness	—	in	0.25
Bentonite Mass/ Unit Area	ASTM D5993	lbs/ft <sup>2</sup> MARV (kg/m <sup>2</sup> MARV)	0.893 (4.34)
Nonwoven	ASTM D5261	oz/yd <sup>2</sup> MARV <sup>1</sup> (g / m <sup>2</sup> MARV)	6.0 (200)
Woven			3.1 (105)
Swell Index	ASTM D5890	—	24 ml (2g) min
Moisture Content	ASTM D4643	% max	12
Fluid Loss	ASTM D5891	ml max	18
Tensile Strength <sup>2</sup>	ASTM D6768	lb/in MARV (kN/m MARV)	30 (5)
Peel Strength	ASTM D6496	lbs/in MARV N/m MARV	3.5 (610)
Permeability <sup>3</sup>	ASTM D5887	m/s max	5 x 10 <sup>-9</sup>
Index Flux <sup>3</sup>	ASTM D5887	m <sup>3</sup> /m <sup>2</sup> /s max	1 x 10 <sup>-8</sup>
Internal Shear Strength <sup>4</sup>	ASTM D6243	psf (kPa)	500 (24)
Elongation <sup>5</sup>	ASTM D4632	%	150
Low Temperature Flexibility	ASTM D1970	@ -25°F (-32°C)	Unaffected
Hydrostatic Head Pressure	ASTM D751	ft (meter)	228 (59.49)
Adhesion to Concrete	ASTM D903	lb/in (kg/cm)	17.7 (8)

<sup>1</sup>Minimum Average Roll Value.

<sup>2</sup>Tested in machine direction.

<sup>3</sup>Deaired, deionized water @ 5 psi (24.5 kPa) maximum effective confining stress and 2 psi (13.8 kPa) head pressure.

<sup>4</sup>Typical peak value for specimen hydrated for 24 hours and sheared under a 200 psf (9.5 kPa) normal stress.

<sup>5</sup>Measure at maximum peak, in the weakest principle direction.

### Limited Warranty

Carlisle Coatings & Waterproofing Incorporated (Carlisle) warrants this product to be free of defects in workmanship and materials only at the time of shipment from our factory. If any Carlisle materials prove to contain manufacturing defects that substantially affect their performance, Carlisle will, at its option, replace the materials or refund its purchase price. This limited warranty is the only warranty extended by Carlisle with respect to its materials. There are no other warranties, including the implied warranties of merchantability and fitness for a particular purpose. Carlisle specifically disclaims liability for any incidental, consequential, or other damages, including but not limited to, loss of profits or damages to a structure or its contents, arising under any theory of law whatsoever. The dollar value of Carlisle's liability and buyer's remedy under this limited warranty shall not exceed the purchase price of the Carlisle material in question.