



# WATERPROOFING

## MiraCLAY® GM (GeoMembrane)

### Description

CCW MiraCLAY GM Bentonite CLAY Waterproofing Membrane with a GeoMembrane Liner is a needle-punched, thermally reinforced composite comprised of a uniform layer of sodium bentonite clay sandwiched between a puncture-resistant, non-woven geotextile and a slit film woven geotextile. Needle-punched fibers are then thermally fused to the woven geotextile and an HDPE film is applied to the woven surface for lower hydraulic conductivity.

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

### Features and Benefits

- The MiraCLAY GM 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).
- The MiraCLAY GM has the ability to expand and seal minor cracks in concrete up to 1/16" in width.
- The MiraCLAY GM has a polyethylene membrane attached for added waterproofing protection.
- MiraCLAY GM has been tested and certified by NSF\*.

### Installation

#### Underslab Applications

MiraCLAY GM 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 GM requires a minimum 5" (150 mm) thick reinforced concrete slab.

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

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

Before installing MiraCLAY GM, 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 GM under main slab area.

**Installation:** Install MiraCLAY GM on conventional concrete wall with the non-woven geotextile fabric facing the structural concrete substrate. On lagging walls and mudslab applications, install MiraCLAY GM with the non-woven geotextile fabric facing the structural concrete placement. 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. MiraCLAY Granules may also be placed in the seam for additional waterproofing performance.

When the slab is poured in sections, MiraCLAY GM should extend a minimum 12" (300 mm) beyond the slab edge. When the installation reaches the outer edge of the slab, continue MiraCLAY GM up and out of the form a minimum of 12" (300 mm). At the corner, MiraCLAY GM should remain in contact with the substrate and inside the surface of the concrete form. When the form is removed, the MiraCLAY GM outside the form should be positioned and fastened onto the footing or vertical wall. Overlay the MiraCLAY GM 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 GM 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 GM 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 GM with the non-woven side facing the installer. Secure the MiraCLAY GM into position with fasteners and 1" (25 mm) washers. Use the appropriate fasteners for the type of substrate used to receive the MiraCLAY GM. Install succeeding courses of MiraCLAY GM 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 GM 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 GM with a rigid termination bar or fasten 12" (300 mm) on center. Embed the top edge of MiraCLAY GM and termination bar with a thick bead of MiraCLAY Sealant 2" (50 mm) wide by 1/2" (12 mm) thick.

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## MiraCLAY GM

### Standard Foundation Walls

**Substrate Preparation:** The substrate must be properly prepared to receive the MiraCLAY GM waterproofing membrane. All honeycombs, form-tie cavities and indentations should be filled with 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 GM waterproofing membrane.

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

### Warnings & Hazards

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

### Packaging

Square Footage: 70 ft (21.34 m<sup>2</sup>)

Dimensions: 5 ft x 14 ft (1.52 m x 4.27 m)

### 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.

### 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	lb/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	m <sup>3</sup> /m <sup>2</sup> /s max%	150
Low Temperature Flexibility	ASTM D1970	@-250°F (-320°C)	Unaffected
Hydrostatic Head Pressure	ASTM D751	ft. (m)	228 (59.49)
Adhesion to Concrete	ASTM D903	lb/in. (kg/cm)	17.7 (8)

1. Minimum Average Roll Value.

2. Tested in machine direction.

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

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

5. 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.