# CCW MIRACLAY EF
# MATERIAL CERTIFICATION

This is to certify that CCW MiraCLAY EF Waterproofing Membrane is a sheet membrane consisting of a uniform layer of sodium Bentonite clay that is sandwiched between a durable puncture resistant non-woven polypropylene fabric and a high tensile strength woven polypropylene fabric and then needle-punched together with thousands of high strength denier yarns which are fused to each layer of fabric. The CCW MiraCLAY EF Granules, MiraCLAY Mastic, CCW MiraSTOP, and CCW MiraDRAIN & 200V/300HV Protection Courses are part of the CCW System and are recommended by Carlisle Coatings & Waterproofing.

CCW manufactures MiraCLAY EF membrane to comply with the following ASTM typical property values and meets the specification requirements

| Miraclay EF - Property | Test Method | Unit | Typical Value |
|---|---|---|---|
| Nominal Dry Thickness | ----- | in. (mm) | 0.25 (6.4) |
| Bentonite Mass/Unit Area | ASTM D 5993 | lbs/ft$^2$ (kg/m$^2$) | 1.0 (4.88) |
| Nonwoven<br>Woven | ASTM D 5261 | oz/yd$^2$ MARV<br>(g/m$^2$ MARV) | 6.0 (200)<br>3.1 (105) |
| Swell Index | ASTM D 5890 | ml (g) | 24 (2g) min |
| Moisture Content | ASTM D 4643 | % max | 12 |
| Fluid Loss | ASTM D 5891 | ml | 18 max |
| Tensile Strength | ASTM D 6768 | lb/in MARV<br>(kN/m MARV) | 30 (5) |
| Peel Strength | ASTM D 6496 | lb/in MARV<br>(N/m MARV) | 3.5 (610) |
| Permeability | ASTM D 5887 | m/s max | 5 x 10$^{-11}$ |
| Index Flux | ASTM D 5887 | m$^3$/m$^2$/s max | 1x10$^{-8}$ |
| Internal Shear Strength | ASTM D 6243 | psf (kPa) | 500 (24) |
| Elongation | ASTM D 4632 | % | 150 |
| Low Temperature Flexibility | ASTM D 1970 | @-25$^0$F (-32$^0$C) | Unaffected |
| Hydrostatic Head Pressure | ASTM D 751 | ft. (m) | 228 (59.49) |
| Adhesion To Concrete | ASTM D 903 | lb/in. (kg/cm) | 17.7 (8) |

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