



Voltite Waterproofing Solutions

Philippine Specific Construction Systems



Whether tropical rainforest, tropical savanna, tropical monsoon or humid subtropical, the Philippine construction industry has a natural enemy – the weather.

Voltite Waterproofing Solutions has created a range of systems specifically designed to allow continuous application regardless of what weather extremes your project is threatened with.



Climate change is affecting the ocean's surface temperature, this additional heat can lead to more frequent storms throughout the Philippines. Water tables & their contaminates are in a state of flux, these changes may adversely affect construction program schedules and should be anticipated.

The Voltite Waterproofing Solutions range, with over 30 years of experience Worldwide, has been designed with performance accelerators & protection measures that are unique to the Philippines (refer BentoShield MAX High Salinity).

The Voltite range allows Architects & Engineers to design protection measures to combat fluctuating water tables, varying hydrostatic pressures, unknown water borne contaminates, high levels of water salinity and deadly hazardous ground gases.



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Aquatrace

- 22. Cloud based Leak Monitoring & Alarm System for podium decks and green roofs, providing immediate knowledge of any water ingress and system breaks

GeoShield Quality Assurance, Risk Assessment and Project Support

- 23. GeoShield operate throughout the Philippines & support all the applications of all Voltite systems (terms are project specific) by providing on-site Quality Assurance Programs

Below Ground / Grade Waterproofing Systems

Voltite Bentonite Geosynthetic Membrane

Voltite is a factory pre-hydrated needle punched waterproofing GCL membrane composed of natural sodium bentonite granules encapsulated between high strength woven and non-woven geotextiles.

Geocomposite	
Permeability ASTM D 5887	<5.0 x 10⁻¹¹ m / sec
Index Flux ASTM D 5887	<1.0 x 10⁻⁸m³ / sec - m²
Tensile Strength ASTM D 6768	>10 kN / m
CBR Puncture EN ISO 12236	>1850 N
Peel Adhesion to Concrete ASTM D 903	>2.0 kN / m
Thickness EN 964-1	6.0 mm



Bentonite layer	
Bentonite Content(1) ASTM 5993	5000 g / m²
Free Swell ASTM D 5890	> 24 ml / 2g
Fluid Loss ASTM D 5891	< 18 ml

Geotextile layers	
Non-Woven -Mass / Unit Area ASTM D 5261	200 g / sq . M
Woven – Mass / Unit Area ASTM D 5261	110g / sq . M

Dimension

Width: 1, 10-1, 25-2, 50-5, 00
Length: 5.00-20-25-40

*Different roll sizes available on demand.

The values in the table are achieved in manufacturers laboratories and accredited testing institutes by following the ASTM Standards and GeoShield quality plan.

- 1) Min. weight of sodium bentonite with 15 % moisture content.
- 2) Results are reported as nominal values with max. 10% tolerance.

Voltite LM

Voltite LM is a factory pre-hydrated needle punched waterproofing GCL membrane composed of natural sodium bentonite granules encapsulated between high strength woven and non non-woven geotextiles.

Geocomposite	
Permeability ASTM D 5887	<5.0 x 10 ⁻¹¹ m / sec
Index Flux ASTM D 5887	<1.0 x 10 ⁻⁸ m ³ / sec-m ²
Tensile Strength ASTM D 6768	10 kN / m
CBR Puncture EN ISO 12236	>1850 N
Peel Adhesion to Concrete ASTM D 903	>2.0 kN / m
Thickness EN 964-1	6.0 mm

Bentonite layer	
Bentonite Content(1) ASTM 5993	5000 g / m ²
Free Swell ASTM D 5890	> 24 ml / 2g
Fluid Loss ASTM D 5891	< 18 ml

Geotextile layers	
PE Layer	0.2mm
Non-Woven -Mass / Unit Area ASTM D 5261	200 g / sq . M
Woven-Mass / Unit Area ASTM D 5261	110g / sq . M



Dimension

Width: 1.10 - 1.25 - 2.50 - 5.00

Length: 5.00 - 20 - 25 - 40

*Different roll sizes available on demand.

The values in the table are achieved in manufacturers laboratories and accredited testing institutes by following the ASTM Standards and GeoShield quality plan.

1) Min. weight of sodium bentonite with 15 % moisture content.

2) Results are reported as nominal values with max. 10% tolerance.

BentoShield MAX

BentoShield MAX is a specially designed waterproofing system that efficiently overcomes the difficulties confronted by traditional systems. The sealing technology of BentoShield MAX combines the unique swelling performance of sodium bentonite with high strength polypropylene geotextiles.

Geocomposite	
Permeability ASTM D 5887	2 x 10⁻¹¹ m/s
Hydrostatic Pressure ASTM D5385	70m
Tensile Strength ASTM D6768	13 Kn/m
Elongation Capacity ASTM D5084	%600
Peel Strength ASTM D6496	60 N/10m
Thickness EN 964-1	6 mm

Bentonite layer	
Bentonite Content ASTM D5993	6.5 kg/m²
Swell Index ASTM D5890	30ml/2 gr
Fluid Loss ASTM D5891	15 ml

Geotextile layers	
Non-Woven -Mass / Unit Area ASTM D5261	200g/sq m
Woven – Mass/Unit Area ASTM D5261	110g/sq m



Dimension

Width: 1.10 - 1.25 - 2.50 - 5.00

Length: 5 - 25 - 40

*Different roll sizes available on demand.

The values in the table are achieved in manufacturers laboratories and accredited testing institutes by following the ASTM Standards and GeoShield quality plan.

1) Min. weight of sodium bentonite with 15 % moisture content.

2) Results are reported as nominal values with max. 10% tolerance.

BentoShield MAX LM

BentoShield MAX LM is a factory prehydrated, needle punched and PE flexible membrane laminated GCL composed of homogeneous layer of sodium bentonite encapsulated between high geotextiles. BentoShield MAX LM acts as a dual protection system with its unique hydraulic and mechanical structure.

Geocomposite	
Permeability ASTM D 5887	<1.0 x 10 ⁻¹¹ m/sec
Index Flux ASTM D 5887	<5.0 x 10 ⁻⁹ m ³ /sec - m ²
Tensile Strength ASTM D 6768	> 10kN/m
CBR Puncture ENISO12236	>1850N
Peel Adhesion to Concrete ASTM D 903	>2.5kN/m
Thickness EN964-1	6.5mm

Bentonite layer	
Bentonite Content (1) ASTM5993	>5000g/m ²
Free Swell ASTM D 5890	>27ml/2g
Fluid Loss ASTM D 5891	<15 ml
Montmorillonite Content XRD Analysis	<80%

Geotextile layers	
Non-Woven -Mass/Unit Area ASTM D 5261	200g/sq m
Woven – Mass/Unit Area ASTM D 5261	110g/sq m
PE Thickness ASTM D 5199	0.2 mm



Dimension

Width: 1.10 - 1.25 - 2.50 - 5.00

Length: 5 - 25 - 40

*Different roll sizes available on demand.

The values in the table are achieved in manufacturers laboratories and accredited testing institutes by following the ASTM Standards and GeoShield quality plan.

- 1) Min. weight of sodium bentonite with 15 % moisture content.
- 2) Results are reported as nominal values with max. 10% tolerance.

BentoShield MAX LM (High Salinity)

BentoShield MAX LM (High Salinity) is a specially designed below grade waterproofing for contaminated and acidic conditions containing high level of salt concentration. It uniquely combines the self healing property of polymer modified sodium bentonite with impermeable PE film and acts as a dual protection system.

Geocomposite	
Hydrostatic Pressure ASTM D 5385	<110 m
Tensile Strength ASTM D 6768	>12 Kn/m
Puncture Resistance ENISO12236	>2250N
Low/Temperature Flexibility ASTM D1970	>Unaffected at 32°C
Thickness EN964-1	6.00 mm

Bentonite layer	
Bentonite Layer (1) ASTM5993	>500g/m ²
Swell Index ASTM D 5890	>30 ml/2g
Fluid Loss ASTM D 5891	<12 ml

Multifunctional layers	
Cap Layer ASTM D 5261	200g / sq m
Carrier Layer ASTM D5261	110g / sq m
PE Film Layer ASTM D 5199	0.2mm / 0.3mm



Dimension

Width: 1.10 - 1.25 - 2.50 - 5.00

Length: 5.00 - 20 - 25 - 40

*Different roll sizes available on demand.

The values in the table are achieved in manufacturers laboratories and accredited testing institutes by following the ASTM Standards and GeoShield quality plan.

1) Min. weight of sodium bentonite with 15 % moisture content.

2) Results are reported as nominal values with max. 10% tolerance.

Ancillaries

- Voltite Bentonite Waterstop
- BentoShield MAX Waterstop, Polymer Enhanced Bentonite
- Waterstop Fixing Strip
- Voltite Bentonite Granules
- BentoShield MAX Granules
- Voltite Bentopaste
- BentoShield MAX Bentopaste
- 38mm Steel Fixings
- Fixing Washers

For more information about the Voltite Ancillaries, please contact your local Voltite representative. All Technical Data Sheets can be sent electronically.

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Remedial, Retrospective Waterproofing & Soil Stabilization

DuraGel

DuraGel is a pumpable sodium bentonite composite used for tunnel boring, wall void filling, soil stabilization and as a hydraulic barrier in post construction waterproofing.

General properties	Test method	Unit	Typical Value
Moisture	ACC TP-2006	%	.12
Free Swell	ASTM D 5890	ml/2g	25
Fluid Loss	ASTM D 5891	ml	18
Water Absorption	ASTM E946-92	%	600
Specific Gravity	As accepted	–	2.50
Particle Sizing	ACC TP-1015	200 mesh	85% min passing
Specific Gravity	ISO 9863-1	mm	5.0
Packaging			
Bags	–	kg	25/50
Jumbo Bags	–	ton	1 / 1.2

Applications

- Fresh water drilling
- Slurry Walls
- Tunnel Boring
- Foundation Drilling

Benefits

- Mixing quickly and easily
- High Colloidal Suspensions
- Cools the drilling tool
- Lubricating Characteristics

Mixing and dosage

DuraGel should be mixed slowly with water using a highly efficient jet mixer. If the water is highly acidic, it should be pre pre-treated with Soda Ash before the application of DuraGel for more satisfactory results.

Storage

Keep DuraGel in a dry place on pallets as lying flat and closed in original packaging. At outdoor storage, well drained location and protective waterproof plastic sheeting is recommended.

Further Information: DuraGel can be used in several areas. For further application details and technical support, please contact our local offices.

DuraMer

DuraMer is a pumpable sodium bentonite composite used for tunnel boring, wall void filling, soil stabilization and as a hydraulic barrier in post construction waterproofing. DuraMer is designed for applications in saline ground water solutions.

General properties	Test method	Unit	Typical Value
Moisture	ACC TP-2006	%	.10
Free Swell	ASTM D 5890	ml/2g	28
Fluid Loss	ASTM D 5891	ml	12
Water Absorption	ASTM E946-92	%	600
Specific Gravity	As accepted	–	2.50
Particle Sizing	ACC TP-1015	200 mesh	85% min passing
Specific Gravity	ISO 9863-1	mm	5.0
Packaging			
Bags	–	kg	25/50
Jumbo Bags	–	ton	1 / 1.2

Applications

- Fresh water drilling
- Slurry Walls
- Tunnel Boring
- Foundation Drilling

Benefits

- Low cost slurry disposal
- Easily hydrates at salty water
- Highly concentrated
- Lubricating Characteristics

Mixing and dosage

DuraMer should be mixed slowly with water using a highly efficient jet mixer. Dosage changes according to the kind of use and to stratigraphy.

Storage

Keep DuraMer in a dry place on pallets as lying flat and closed in original packaging. At outdoor storage, well drained location and protective waterproof plastic sheeting is recommended.

Further Information: DuraMer can be used in several areas. For further application details and technical support, please contact our local offices.

Cross Sectional & Horizontal Drilling, Jacking

DuraMax

DuraMax is a pumpable sodium bentonite dry polymer enhanced composite, created to withstand greater loading capacities, used for cross sectional drilling under roadways, structural jacking, raft support & soil stabilization and as a hydraulic barrier in post construction waterproofing.

General properties	Test method	Unit	Typical Value
Moisture	ACC TP-2006	%	.12
Free Swell	ASTM D 5890	ml/2g	25
Fluid Loss	ASTM D 5891	ml	15
Water Absorption	ASTM E946-92	%	600
Specific Gravity	As accepted	–	2.50
Particle Sizing	ACC TP-1015	200 mesh	85% min passing
Specific Gravity	ISO 9863-1	mm	5.0
Packaging			
Bags	–	kg	25/50
Jumbo Bags	–	ton	1 / 1.2

Applications

- Fresh water drilling
- Angle drilling
- Horizontal drilling
- Jacking

Benefits

- Low fluid loss and consumption
- Maintains borehole integrity
- Highly concentrated
- Prevents bit balling problems.

Mixing and dosage

DuraMax should be mixed slowly with water using a highly efficient jet mixer. Dosage changes according to the kind of use and to stratigraphy.

Storage

Keep DuraMax in a dry place on pallets as lying flat and closed in original packaging. At outdoor storage, well drained location and protective waterproof plastic sheeting is recommended.

Further Information: DuraMax can be used in several areas. For further application details and technical support, please contact our local offices.

Concrete Matting, Immediate & Emergency Concrete Placement

Voltite CM

Voltite CM is an easily formed, extremely flexible, intensely durable, concrete sheet. Consisting of concrete-sand mix contained between two layers of high strength geo-textiles, Voltite CM allows you to immediately form a concrete barrier and retaining structure when & wherever it's needed, ideal for water course creation, containment & as protection against soil erosion.

Properties of geotextile

Carrier Layer– PP Non woven Composite 350 g/m²
EN ISO 9864

Cover Layer– PP Non woven 200 g/m²
EN ISO 9864

Properties of concrete

Chemical Composition Sand Cement Mix
XRF

Density 1.42 g/cm²
Typical

Setting Start >90min
PN-EN 196-3

Properties of Voltite cm (1)

Tensile Strength MD/CMD ≥ 20.0 / 20.0 Kn/m (±10%)
EN ISO 10319

CBR Puncture Strength ≥ 3.0 Kn (±10%)
EN ISO 12236

Properties of Voltite cm (2)

Compressive Strength 40 MPa
ASTM C 109-02

Bending tests based 6.0 MPa – Class1
PN EN 12467:2016-08 5.4.3

Water Impermeability No drop of water
PN EN 12467:2016-08 5.4.5-6

Durability against Freeze-thaw RL ≥ 0.75 Pass
PN EN 12467:2016-08 5.5.2

Durability against Heat – Rain RL ≥ 0.75 Pass
PN EN 12467:2016-08 5.5.3

Durability against warm water RL ≥ 0.75 Pass
PN EN 12467:2016-08 5.5.4

Durability against Soak-dry RL ≥ 0.75 Pass
PN EN 12467:2016-08 5.5.5

Reaction to Fire B B-s1, d0*
PN EN 12467:2016-08 5.6



(1) Before hydration

(2) After hydration

*Complies with EN 13501-1

The data are average values derived from standard tests and are subject to usual product variation. The right is reserved to make changes without notice at any time.

Properties of Voltite CM(1)	Voltite CM 7	Voltite CM 9	Voltite CM 10	Voltite CM 12
Mass per unit area of concrete EN 14196	7000 g/m² (±10%)	9000 g/m² (±10%)	10000 g/m² (±10%)	12000 g/m² (±10%)
Mass per unit area of Voltite CM EN 14196	7550 g/m² (±10%)	9550 g/m² (±10%)	10550 g/m² (±10%)	12550 g/m² (±10%)
Thickness EN ISO 9863-1/ -2	7.0 mm (±1mm)	9.0 mm (±1mm)	10.0 mm (±1mm)	12.0 mm (±1mm)

Standard Roll Dimensions	Test Method	Value
Width x Length	Typical	(5.0 x 20) m / (2.5 x 20) m
Quantity	Typical	100 / 50 m ²

(1) Before hydration

(2) After hydration

*Complies with EN 13501-1

The data are average values derived from standard tests and are subject to usual product variation. The right is reserved to make changes without notice at any time.

Voltite CM Plus

Voltite CM Plus is a highly durable, puncture resistant containment membrane. Voltite CM Plus provides the dual protection of a high strength concrete sheet with the support of a polyethylene laminated layer. Voltite CM Plus allows you to immediately form a concrete barrier and retaining structure when & wherever it's needed, ideal for water course creation, containment & as protection against soil erosion.

Properties of geotextile

Carrier Layer– PP Non woven Composite	350 g/m² EN ISO 9864
Cover Layer – PP Nonwoven	200 g/m² EN ISO 9864
PE Membrane	0.2mm PN EN 1849-2

Properties of concrete

Chemical Composition	Sand Cement Mix XRF
Density Typical	1.42 g/cm²
Setting Start PN-EN 196-3	>90min

Properties of Voltite cm (1)

Tensile Strength MD/CMD EN ISO 10319	≥ 20.0 / 20.0 Kn/m (±10%)
CBR Puncture Strength EN ISO 12236	≥ 3.0 Kn (±10%)

Properties of Voltite cm (2)

Compressive Strength ASTM C 109-02	40 MPa
Bending tests based PN EN 12467:2016-08 5.4.3	6.0 MPa – Class1
Water Impermeability PN EN 12467:2016-08 5.4.5-6	Impermeable
Durability against Freeze-thaw PN EN 12467:2016-08 5.5.2	RL ≥ 0.75 Pass
Durability against Heat – Rain PN EN 12467:2016-08 5.5.3	RL ≥ 0.75 Pass
Durability against warm water PN EN 12467:2016-08 5.5.4	RL ≥ 0.75 Pass
Durability against Soak-dry PN EN 12467:2016-08 5.5.5	RL ≥ 0.75 Pass
Reaction to Fire B PN EN 12467:2016-08 5.6	B-s1, d0*



(1) Before hydration

(2) After hydration

*Complies with EN 13501-1

**Manufacturer can use foil in range of 0.2-2 to read

**PE laminate film is available thicknesses of 0.2mm to 2mm on request

The data are average values derived from standard tests and are subject to usual product variation. The right is reserved to make changes without notice at any time.any time.

Properties of Voltite CM Plus (1)	Voltite CM 7 Plus	Voltite CM 9 Plus	Voltite CM 10 Plus	Voltite CM 12 Plus
Mass per unit area of concrete EN 14196	7000 g/m ² (±10%)	9000 g/m ² (±10%)	10000 g/m ² (±10%)	12000 g/m ² (±10%)
Mass per unit area of Voltite CM Plus EN 14196	7550 g/m ² (±10%)	9550 g/m ² (±10%)	10550 g/m ² (±10%)	12550 g/m ² (±10%)
Thickness EN ISO 9863-1/ -2	7.2 mm (±1mm)	9.2 mm (±1mm)	10.2 mm (±1mm)	12.2 mm (±1mm)

Standard Roll Dimensions	Test Method	Value
Width x Length	Typical	(5.0 x 20) m / (2.5 x 20) m
Quantity	Typical	100m ² / 50 m ²

(1) Before hydration

(2) After hydration

*Complies with EN 13501-1

**Manufacturer can use foil in range of 0.2-2 to read

**PE laminate film is available thicknesses of 0.2mm to 2mm on request

The data are average values derived from standard tests and are subject to usual product variation. The right is reserved to make changes without notice at any time.any time.

Quality Assurance, Risk Assessment and Project Support



With over 3 decades of experience globally, GeoShield offer a unique approach to protecting the structures of the Philippines against the ingress of damaging ground water and the perils of leaking roof decks.

GeoShield have created a project bespoke system of Quality Assurance that includes:

- Design & Validation
- On -site Verification
- Bespoke Method Statements
- Cloud based Verification
- Training of Management and Application Teams
- Every m² Verified

GeoShield's exclusive approach has proven effective all over the world and creates confidence in waterproofing performance. Using the latest software technology, solutions can be found within hours. To supplement GeoShield's quality assurance program we use Aquatrace.

