

#### **Urban Greenery** & Waterproofing Products



We make the difference. The Elmich Difference.

# Elmich in brief

**Elmich Pte Ltd** is a leading manufacturer and distributor of state-of-the-art and ecologically-minded urban landscaping, drainage, stormwater management, and waterproofing solutions to developers, architects, and contractors around the world.

Elmich prides itself as a professional, responsible, and eco-sensitive company with sound management and quality practices certified under ISO 9001:2015 (Quality Management), ISO 14001:2015 (Environmental Management), and SS ISO 22301:2019 (Business Continuity Management).

As a multi-award-winning company of Enterprise 50, Enterprise Transformation, and the Top Honour recipient of Singapore Business Federation's Sustainability Award, Elmich affirms its commitment to quality, innovation, and resilience.

Everyone who works at Elmich is focused on – enhancing lives for you and future generations.

At Elmich, we are focused on enhancing lives for the present and future generations.



Elmich main offices & partners worldwide Covering more than 30 countries across the world

SINGAPORE AUSTRALIA MALAYSIA SWITZERLAND GERMANY•USA

# Urban Greenery

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#### VersiJack® Paver & Deck Screwjack Pedestal

**VersiJack®** has top and bottom slope correction options to compensate for gradients to create levelled surfaces. Using a Bottom Slope Corrector allows the pedestal to remain firmly upright on an incline.

VersiJack<sup>®</sup> has a large flat base with rounded edges to prevent the waterproofing membrane from being compromised. The perforated base prevents the breeding of insects resulting from ponding. Grooves allow the base to be cut to fit wall corners and edges.







#### Features & Benefits

- Creates usable space
- Progressive height increments
- Easy access to waterproofing membranes
- Improves insulation and conceals services
- Lightweight and reusable

#### **Applicable Areas**

- Plaza decks
- Balconies
- Swimming pool surrounds
- Verandahs
- Courtyards
- Water features

Material	PP
Height range	13 to 1014 mm
Design compressive strength	10 kN
Slope correction	up to 5% (Top) and 5% (Bottom)

**TECHNICAL SPECIFICATION** 



VersiJack<sup>®</sup> is part of our Paver & Deck Support range of adjustable Elmich pedestals (4–1022 mm)

#### **Accessories**



**Bearer Holder** 



**Exposed Paver Retainer** 



Wall Spacer



**Pedestal Shim** 



**Concealed Paver Retainer** 



Vertical Edge Clips



**Top Slope Corrector** 



Variable Angle Spacer Tab



**Base Slope Corrector** 



**Top Extender** 



Bracing



**Base Extender** 





#### Mandarin Oriental Hotel Malaysia

Visitors to the Kuala Lumpur City Centre at dusk are treated to a dazzling synchronised display of water, lights, and colours in front of the Mandarin Oriental Hotel. The large granite pavers of the prominent water fountain feature are supported by **VersiJack**<sup>®</sup> height and slope adjustable pedestals, each with a compressive strength of 1.5 tonnes.

The raised pavers hide the required cabling and pump system for the fountain and also provide the gaps between pavers that allow water issuing from the fountain to seemingly disappear upon coming in contact with the paver surface.



#### **SpiraPave®** Paver & Deck Stepjack Pedestal

**SpiraPave**<sup>®</sup> is a height and slope-adjustable pedestal with a unique 'step' design for supporting raised pavers and timber decking. It provides a cavity to conceal services, improves heat and sound insulation, and facilitates rapid surface drainage whilst allowing waterproofing membranes and services to remain accessible.



The height range of SpiraPave<sup>®</sup> is 12–74 mm, at 1 mm increments. The additional height of 45 mm is obtained with the use of a SP-45E extender.



SpiraPave® is part of our Paver & Deck Support range of adjustable Elmich pedestals (4–1022 mm)

#### Features & Benefits

- Low minimum height of 12 mm
- Precise 1 mm height adjustment
- Easy access to waterproofing membranes
- Improves insulation and conceals services
- Lightweight and reusable

#### **Applicable Areas**

- Balconies, terraces & decks
- Swimming pool surrounds
- Verandahs
- Courtyards

#### TECHNICAL SPECIFICATION

Material	PP
Height range	12 to 119 mm
Design compressive strength	15 kN
Slope correction	up to 5% (Top) and 5% (Bottom)
Fixed extender height	45 mm

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#### VersiPave® Independent Paver Correction

**VersiPave®** is a height-adjustable pedestal for paver support, engineered to provide a cost-effective solution to support raised pavers with inconsistent or uneven thickness.

The height range of VersiPave® starts from 12 mm and can be adjusted in 1 mm increments. Additional height can be obtained using 10, 20, 30, 40, and 60 mm Extenders. VersiPave® is cost-effective and can be quartered or halved for placement along wall edges and corners.



#### Features & Benefits

- Low minimum height of 12 mm
- Precise 1 mm height adjustment
- Easy access to waterproofing membranes
- Improves insulation and conceals services
- Lightweight and reusable

#### **Applicable Areas**

- Balconies, terraces & decks
- Swimming pool surrounds
- Verandahs
- Courtyards

#### **TECHNICAL SPECIFICATION**

Material	PP
Height range	12 to 45 mm
Design compressive strength	10 kN
Fixed extender height	10 / 20 / 30 / 40 / 60 mm







#### VersiFrame® Aluminium Joist Substructure System

**VersiFrame®** is an aluminium joist system using VersiJack® pedestals to efficiently and easily establish a rigid and stable raised paving or decking installation. The robust stability of the VersiFrame® system prevents displacement of its components when flooring is removed during maintenance of hidden mechanical and electrical services.

# PAVING

#### **TECHNICAL SPECIFICATION**

Material	Alum	inium
Height range	25 mm	35 mm
Supply length	2.4	l m
Pedestal span along joist		
- Live load @ 3.0 kN/m <sup>2</sup> - Live load @ 5.0 kN/m <sup>2</sup>	600 mm 400 mm	900 mm 600 mm

#### Features & Benefits

- High strength, durable and reliable substructure
- Efficient and uncomplicated installation process
- Versatile with an array of accessories to accommodate various designs
- Locked to VersiJack<sup>®</sup> pedestals with a Joist Adaptor for increased stability to prevent unintended movement





#### **VF E-Support** Edge Support For Non-Right Angled Pavers

**VF E-Support** enables flexible paving layouts without the need for support brackets fastened to the perimeter wall. The VF E-Support is installed on VersiJack<sup>®</sup> Pedestals and uses E-Support Spacer Tabs to support odd-shaped or narrow pavers along the edge of a paver layout.



#### **Features & Benefits**

- Installation of raised pavers along an irregular perimeter wall
- 360° rotating spacer tabs for flexibility of paver installation
- Dynamic 3 rail joist system for ease of positioning

#### **TECHNICAL SPECIFICATION**

VF E-Support		
Material	Aluminium	
Joist size	1000 (L) x 140 (W) x 25 (H) mm	
E-Support Spacer Tab		
Material	PP	
Spacer Tab thickness	3 / 4 / 5 / 6 / 8 mm	





Pavers laid directly on pedestals

VersiFrame® substructure for paving and decking

#### Creating everlasting substructures for raised paving systems

An aluminium joist raised paving system provides a precise frame for paver replacement, preventing any potential floor misalignments due to improper handling during routine maintenance.

The top surface of the **VersiFrame®** Aluminium Joist has thermoplastic rubber strips that provide sound and vibration dampening as well as paver movement minimisation.

Rather than setting the pavers directly on pedestals, a cost-effective solution is to use an aluminium substructure, which reduces the number of pedestals required to support the load of the raised floor while also speeding up the installation process.

Building owners can relax, knowing that their outdoor patio or roof terrace will look as good as it did when it was first built, while also benefitting from concealed services and easy access to waterproofing membranes.

# Selecting the right joist material for your deck

Choosing the right joist material can go a long way in ensuring the longevity of your deck. Traditional joist materials, whilst cheaper at getting the job done, do not hold up well to the test of time. Timber, for example, is a popular option for conventional joists, being a natural, non-toxic, and fully sustainable material.

However, timber is susceptible to rot and mould, requiring frequent maintenance to ensure the health and integrity of the material. In addition, timber is sensitive to moisture and heat, and is susceptible to distortions and cracks when subjected to unfavourable weather conditions. As a rule of thumb, porous materials such as wood or concrete run the risk of structural failure after long-term usage. As such, a better alternative to conventional joists is **VersiFrame**<sup>®</sup> Aluminium Joist.

Aluminium joists have multiple advantages when compared to timber ones, including lower maintenance requirements and better structural strength.





#### **Conventional Paver Assembly**

VersiScape<sup>™</sup> supports nominal 600x600 mm pavers and porcelain tiles.





## VersiScape<sup>™</sup> supports tiles of varying sizes, thicknesses and

Variable Paver Assembly

materials allowing for design flexibility.

#### Artificial Landscape Assembly

VersiScape<sup>™</sup> creates a levelled surface for non-paver finishes.

#### **VersiScape<sup>TM</sup>** Support Panel for Landscape Finishes

**VersiScape<sup>™</sup>** is engineered to provide a raised substructure with the strength and stability to create a customisable and safe landscape.

The system constructs a levelled surface that accommodates virtually any landscape finish, from pavers to porcelain tiles of varying sizes with minimum thickness of 20 mm.



TECHNICAL SPECIFICATION	
Material	PP
Dimension	600 (L) x 600 (B) x 32 (H) mm
Weight	2.65 kg
Coverage	~2.8 pcs/m <sup>2</sup>

In the event of accidental tile breakage, VersiScape<sup>™</sup> is able to withstand the weight of broken shards and human loads. This prevents injury to pedestrians and simplifies the maintenance of the broken finishes.





#### VersiWall® GP 2060 Wind-Resistant Green Wall Tray

#### VersiWall® GP 2060 (VGP 2060) is an

easy-to-install and low-maintenance modular vertical greening system with a choice of mounting, planting density and growth media options to suit different wall conditions.

#### Applicable Areas

- Interior walls
- Exterior walls
- Free standing walls
- Building facades



Wind-Resistant Fire-Resistant EN13501-1 Class B available



#### Features & Benefits

- Allows different spacing for varied plant densities on the wall
- Universal mounting
- Anti-lift arms prevent dislodging of trays
- Proprietary mounting panel reduces number of bolts required
- Certified by independent international test authority to withstand wind uplift from various directions up to 108 km/h

**TECHNICAL SPECIFICATION** 

Material	PP
Dimension	Tray: 200 (L) x 150 (H) x 195 (D) mm Mounting Panel: 400* (L) x 900* (H) x 22 (D) mm
Tray pitch	150–225 mm
Planting media volume	~1.8 L
Weight	~75 kg/m²

\*Mounting Panel may be cut to size as required





#### VersiWall® GP 250 Slim Profile Green Wall Tray

**VersiWall® GP 250 (VGP 250)** is designed with both ease of installation and safety in mind. Trays can be mounted on a flat bar or wire mesh, which includes security clips and a security screw system to prevent the trays from being accidentally dislodged.

#### Applicable Areas

- Interior walls
- Exterior walls
- Free standing walls
- Building facades





#### **Features & Benefits**

- Easily secured directly to the wall or mesh
- Standard \*pots (90 mm base diameter) can fit snugly into the engineered rib design of the tray for temporary green wall display

TECHNICAL SPECIFICATION	
Material	PP
Dimension	Tray: 250 (L) x 143 (H) x 140 (D) mm Rail: 1000* (L) x 50 (H) x 16 (D) mm
Tray pitch	150–220 mm
Planting media volume	~2.1 L
Weight	~50 kg/m²

\*not included



#### VersiWall® GT Aluminium Green Wall Tray

**VersiWall® GT (VGT)** is a modular green wall system which gives architects and builders flexible and cost-effective solutions to create living walls for both indoor and outdoor greenery. Manufactured from aluminium, VGT consists of rows of pilasters attached to a wall, onto which the trays and irrigation system hook on.

#### **Applicable Areas**

- Interior walls
- Exterior walls
- Free standing walls
- Building facades



Fireproc



#### Features & Benefits

- Fire-proof
- Durable
- Fast & simple modular installation
- Anti-lift screws prevent tray dislodgement

#### **TECHNICAL SPECIFICATION**

Material	Aluminium
Dimension	Tray: 1000* (L) x 125 (H) x 95 (D) mm Pilaster: 38 (L) x 1200* (H) x 108 (D) mm
Tray pitch	200 mm
Planting media volume	~6.3 L
Weight	~70 kg/m <sup>2</sup>

\*Tray and pilaster may be cut to length as required

Vertical Greenery



#### VersiWall<sup>®</sup> FR Fire-Resistant Green Wall Panel

**VersiWall® FR** is a fire-resistant modular composite green wall system which gives architects and builders a cost-effective solution for urban greenery. It uses a combination of materials that mitigates the issue of fire safety and allows the elegant articulation of attractive living walls anywhere.

#### **Applicable Areas**

- Interior walls
- Exterior walls
- Free standing walls
- Building facades



Fire-Resistant BS 476 Class 0



#### Features & Benefits

- Fire-resistant
- Cost-effective, flexible for on-site modification
- Fast installation times with modular pre-fab system
- Concealed irrigation

# TECHNICAL SPECIFICATIONMaterialFire-resistant mediaDimension1200 (L) x 1200 (H) x 30 (W) mmWeight~40 kg/m²Fire ratingBS 476 Class 0

Vertical Greenery



#### **VersiWall® GM** Wind-Resistant Green Wall Cassette

VersiWall<sup>®</sup> GM (VGM) is an engineered architectural living wall system comprising VGM<sup>®</sup> planting modules each with a geotextile media bag, support brackets with covers, anti-lift arms and anchoring pilaster systems. This is paired with our proprietary planting media and an automated drip irrigation-cum-fertilization (fertigation) system to ensure optimum results.

VersiWall<sup>®</sup> GM uses UV-stabilised plastic modules and stainless steel support brackets and pilasters.





Wind-Resistant



Steel Support

& Mounting

#### **Features & Benefits**

- Ample media room to support robust root growth
- Modules are established in nursery before installation
- Certified by independent international test authority to withstand wind uplift from various directions up to 110 km/h

#### **Applicable Areas**

- Interior walls
- Exterior walls
- Free standing walls
- Building facades

TECHNICAL SPECIFICATION	
Material	PP
Dimension	500 (L) x 600 (H) x 150 (D) mm
Internal volume	~24 L
Weight	~170 kg/m²



#### Elmich Green Wall Braved Strongest Typhoon of 2016



At Zhongshan Road Pedestrian Street, bolted on the front of JI Hotel Xiamen is Elmich's **VersiWall® GM** (VGM) green wall that measures about 220 sq m. The green wall is a significant aesthetic feature for the hotel to welcome its visitors and can be easily recognised from afar by tourists who are unfamiliar with the new environment.

In September 2016, super typhoon 'Meranti' made landfall in Xiamen City, Fujian with a wind gust speed of around 170 km/h bringing heavy downpours and causing major disruptions to the electricity and water supplies affecting more than 3.2 million homes located in the region. Elmich's VGM green wall at JI Hotel Xiamen stood firm and intact despite the super typhoon.

Elmich's VGM mounting system is equipped with anti-lift arms and is a proprietary anchoring pilaster system that is certified by an independent international test authority to withstand wind uplift from various directions up to 110 km/h.



#### VersiDrain® 30 Planting Tray

VersiDrain® 30 is a lightweight interlocking modular green roof tray designed for versatility. Its flexibility allows it to be easily cut to fit different shapes and conforms with ease to curved surfaces. Its easy-to-interlock feature facilitates connecting adjacent trays together for stability.

VersiDrain<sup>®</sup> 30 comprises a network of reservoirs





#### **Features & Benefits**

- Provides efficient drainage
- Protects waterproofing membrane
- Enable on-site rainwater retention
- Recyclable
- Suitable for retrofitting and/or new projects
- Mitigate urban runoff
- Can be cut to fit any shaped green roof

#### **Applicable Areas**

- Extensive green roofs
- Planter boxes
- Roadside turfing

Material	PP
Dimension	500 (L) x 500 (W) x 30 (H) mm
Planting media height	variable*
Reservoir capacity	13.2 L/m <sup>2</sup>

**TECHNICAL SPECIFICATION** 

\*Varies according to design parameters





#### VersiDrain<sup>®</sup> 60 Extendable Wall Planting Tray

**VersiDrain® 60** is a lightweight interlocking modular green roof tray designed for versatility. It allows the addition of optional Wall Extenders to increase the planting depth up to 100 mm and for off-site planting to achieve instant greening of rooftops.

VersiDrain<sup>®</sup> 60 comprises a network of reservoirs that stores 18 litres of rainwater per square metre for irrigating the plants, thus reducing watering requirement and costs, promoting plant growth in a sustainable manner. The Wall Extenders between trays can be easily removed where desired to form a monolithic planting surface.



#### Features & Benefits

• Provides efficient drainage

- Reduces irrigation requirement
- Protects waterproofing membrane
- Enable on-site rainwater retention
- Recyclable
- Suitable for retrofitting and/or new projects
- Mitigate urban runoff
- High water storage capacity

#### Applicable Areas

- Extensive green roofs
- Planter boxes

IECHNICAL SPECIFICATION		
Material	PP	
Dimension	500 (L) x 500 (W) x 60 / 130 (H)* mm	
Planting media height	variable** / 100* mm	
Reservoir capacity	18 L/m <sup>2</sup>	

\*With Wall Extenders \*\*Varies according to design parameters



SGB



#### VersiDrain<sup>®</sup> 150 Pre-Planted Modular Planting Tray

**VersiDrain® 150** is a lightweight interlocking modular green roof tray with high walls, suitable for pre-planting off-site.

It comprises a network of reservoirs that stores 32 litres of rainwater per square metre for irrigating the plants, thus reducing watering requirement and costs, promoting plant growth in a sustainable manner.



#### Features & Benefits

- Provides efficient drainage
- Reduces irrigation requirement
- Protects waterproofing membrane
- Enable on-site rainwater retention
- Lightweight and durable
- Recyclable
- Suitable for retrofitting and/or new projects

**TECHNICAL SPECIFICATION** 

- Mitigate urban runoff
- High water storage capacity

#### Applicable Areas

- Extensive green roofs
- Planter boxes

PP

500 (L) x 500 (W) x 150 (H) mm

100 mm 32 L/m<sup>2</sup>

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#### Dimension Planting media height Reservoir capacity

Material

42



#### **MEP® Tray** Pre-Planted Modular Planting System

Modular Extensive Planting (MEP®) Tray

adopts a modular tray design, which is lightweight and robust. It has water storage compartments that passively assist irrigation requirements and is made from high-strength UV-stabilised polypropylene.

Each MEP® Tray, including accessories, saturated planting media, plants and stored water, weighs approximately 38 kg. The self-contained MEP® Tray may be pre-planted in a nursery prior to installation.



Joiner

#### Features & Benefits

- Established green roof upon installation
- Modular, lightweight and portable
- Closed drainage system
- Watertight connectors
- Spill-proof planting media containment

#### **Applicable Areas**

- Rooftops
- Metal decks
- Concrete decks
- Patios
- Walkways

I ECHNICAL SPECIFICATION	
PP	
500 (L) x 500 (W) x 150 (H) mm	
75 mm	
40 L/m <sup>2</sup>	

Green Roof





#### VersiDrain<sup>®</sup> BG<sup>®</sup> BlueGreen<sup>™</sup> Roof Tray System

**VersiDrain® BG®** is an extensive green roof planting tray with the added functionality of creating a bluegreen roof. It is a lightweight and robust planting tray made from high-strength UVstabilised recyclable plastics. The tray comprises of three layers: a planting layer, an irrigation reservoir layer, and a stormwater attenuation layer.

Its internal irrigation reservoir promotes plant sustainability with minimised maintenance.





#### **Features & Benefits**

- Integral component to at-source stormwater management
- Reduce peak runoff flow rates
- Does not compromise the roof's waterproofing warranty
- Adaptability to various storm events

#### **TECHNICAL SPECIFICATION**

Material	PP
Dimension	500 (L) x 500 (W) x 150 (H) mm
Planting media height	75 mm
Irrigation reservoir capacity	~10 L/m²
Stormwater attenuation capacity (includes irrigation reservoir capacity)	~40 L/m²

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GB



#### EnviroMix<sup>®</sup> PB Nutrient-Infused Lightweight Media Board

**EnviroMix® PB** is a lightweight organic planting board manufactured from environmentally sustainable materials enhanced with additives, including nutrients beneficial for healthy plant growth. It is made up of primarily recycled organic products that has undergone microwave sterilisation. It is an ideal planting medium for green roofs where weight is a major consideration.

It has the ability to absorb and retain water 3 times its weight and yet remain lighter than conventional media which holds much lesser water when saturated.



#### Features & Benefits

- Stackable for on-site storage
- Easily cut for flexible design and layout
- Minimal backfill of soil required
- Retains water for plant growth during short drought periods

#### **Applicable Areas**

- Rooftops
- Extensive green roofs

#### **TECHNICAL SPECIFICATION**

Dimension	500 (L) x 333 (W) x 50 (H) mm
Weight	Dry: ~14.4 kg/m <sup>2</sup> Saturated: ~45 kg/m <sup>2</sup>



#### VersiCell® Sub-Surface Drainage Cell

**VersiCell**<sup>®</sup> is designed and engineered for sub-surface drainage, heat and sound insulation, as well as providing waterproofing membrane protection.

It eliminates the use of heavy gravel aggregates for sub-surface drainage and screeds for waterproofing membrane protection in planter boxes and roof gardens. VersiCell<sup>®</sup> is also applied on retaining walls to prevent build up of hydrostatic pressure.



#### **Features & Benefits**

- High internal void
- High compressive strength
- Lightweight
- Modules interlock for stability and easy installation
- Protects waterproofing membranes

#### **Applicable Areas**

- Intensive green roofs
- Landscaped decks
- Planter boxes
- Basement walls
- Retaining walls
- Paved areas & roadways
- Sports fields

TECHNICAL SPECIFICATION	
Material	PP
Dimension	500 (L) × 500 (W) × 20 / 30 (H) mm
Compressive strength	>800 kN/m <sup>2</sup>
Discharge rate @ 1% gradient	>16.5 L/m.s



#### Marina Barrage Singapore

A VIEW - COMPANY IN MAL

The Marina Barrage is Singapore's multi-purpose attraction. Its green roof commands a stunning panoramic view of Singapore's cityscape. The lush green lawn and recreational space on the green roof are made possible by the application of a bonded waterproofing membrane over the roof skin protected by cement and sand screed followed by the installation of 14,000 sq m of **VersiCell®** drainage modules.

VersiCell®'s lightweight structure, high compressive strength, rapid water capture, and highly efficient drainage capability as well as its ability to be easily joined into large panels on-site made it the ideal drainage module for the extensively large sloping roof of the Marina Barrage.



#### TurfPave® XD Grass & Gravel Paver

**TurfPave<sup>®</sup> XD** is a high strength stabilisation module designed to contain grass or decorative gravel for emergency vehicular access ways and occasional vehicular traffic.

It replaces asphalt and concrete to create permeable surfaces thereby enabling these areas to blend into the aesthetics of their surroundings.



#### Features & Benefits

- Distributes vehicle weight on turf surfaces
- Able to support heavy vehicles
- Allows water infiltration
- Does not hinder root and runner growth

#### **Applicable Areas**

- Fire engine access lanes
- Overflow & street shoulder parking areas
- Private house driveways
- Pedestrian pathways

TECHNICAL SPECIFICATION		
Material	PP	
Dimension	500 (L) x 500 (W) x 40 (H) mm	
Compressive strength	Unfilled: >1,350 kN/m <sup>2</sup> Filled: >66,500 kN/m <sup>2</sup>	





#### VersiWeb® Soil Confinement Cell

**VersiWeb**<sup>®</sup> is a cellular confinement system incorporating ultrasonically bonded flexible thermoplastic strips that form a strong and dimensionally stable honeycombed structure which controls erosion by limiting movement of infill within its individual cells.

It offers architects and developers a comprehensive solution to long term slope and channel protection and stabilisation.



VersiWeb® Anchor Cap

#### **Features & Benefits**

- Long-term slope/channel stabilisation
  and protection
- Conforms to most terrain profiles
- Easily transported and handled on-site

#### **Applicable Areas**

- Slope stabilisation & protection
- Earth retention
- Load support
- Channel & shoreline protection
- Planting media containment

#### **TECHNICAL SPECIFICATION**

Material	HDPE
Dimension	6100 (L) x 2440 (W) x 100–200 (H) mm
Tensile strength	Longitudinal: 18,400 kN/m <sup>2</sup> Transverse: 19,500 kN/m <sup>2</sup>

SGBC



#### VersiTank® On-Site Soak Away Module

**VersiTank**<sup>®</sup> sub-surface water infiltration storage tank provides an efficient, cost-effective, and ecologically sustainable solution for stormwater control and management. It restores on-site natural water filtration, controls the release of surface run-off, and harvests water for on-site reuse.

It can be conveniently installed and is available in several sizes to suit specific installation requirements. When required, tanks can be joined horizontally and vertically, sharing a common panel resulting in cost savings and efficiency.



#### Features & Benefits

- Reduces stormwater run-off
- High compressive strength
- Less costly than concrete and metal systems
- Low storage and transport costs
- Easy assembly and installation
- Improves ground infiltration

#### **Applicable Areas**

- Green parks
- Home gardens
- Sports fields
- Green open spaces
- Swales
- Rain gardens

TECHNICAL SPECIFICATION	
Material	PP
Dimension	500 (L) x 500 (W) x 500 (H) mm
Compressive strength	~150–1,000* kN/m²
Internal void volume	~95%

\*Tanks have different variations to achieve required strength





#### VersiTank® Infiltration System



#### VersiTank® Retention System





#### **Bioswale vs Concrete Drain**

#### **Concrete Drains - Singular Function**

The conventional concrete drain serves only as a conduit for stormwater to be conveyed away from the source expeditiously. However, efficiency at performing this singular role is undermined when high peak flow causes flash floods downstream due to the buildup of drainage bottlenecks. Concrete drains do not contribute to aesthetic enhancement or serve to minimise the urban heat island effect or offer any form of filtration. Mosquito breeding may also be an issue when exposed concrete drains become clogged.



#### **Bioswales In Comparison**

In comparison, the bioswale or vegetated swale, such as those at the Firefly Park @ Clementi, integrate features that improve water quality, reduce runoff volume, and pollutant loading, both on and off-site, through its infiltration and detention capabilities, in addition to providing the conveyance function of the conventional drain.

The bioswale is an eco-friendly and cost-effective means to manage stormwater runoff at the source, with the potential to improve water quality, enhance landscape aesthetics and provide flood containment without the need for costly stormwater detention construction. It requires little more than normal landscaping to maintain.



High Line Park, USA

#### TreeGrip<sup>™</sup> Rootball Anchoring System

**TreeGrip™** is an underground root ball anchoring system designed to anchor newly planted trees, keeping them upright and supporting them against strong winds.

TreeGrip<sup>™</sup> provides flexibility for root growth, making terrace garden appear natural and beautiful. This system of securing trees has many advantages over staking and is suitable for large root-balled trees.

#### **Benefits**

- Out of sight anchoring
- · Low profile anchor eliminates further excavation

#### **D-Man® Anchor**

D-Man<sup>®</sup> Rootball Anchor is a Platipus<sup>®</sup> tree anchoring system designed to anchor trees in challenging urban environments and roof gardens where planting pits or planters are too shallow to provide sufficient anchoring efficacy or have services buried underneath which hinder tree anchoring.

#### **E-Bolt Anchor**

E-Bolt Rootball Anchor is a Platipus® tree anchoring system that uses expanding eyebolts to stabilise trees without earth anchors in very shallow concrete podiums, on roof gardens or unusual urban sites.





#### StrataVault® Structural RootCell®

StrataVault<sup>®</sup> advanced structural RootCell<sup>®</sup> is engineered to keep trees healthy, ensuring the long term success of urban trees. StrataVault<sup>®</sup> tree pits allow building elements and root systems to share space, reducing installation times and costs while promoting healthy root growth.

The system provides quality soil for healthy tree roots in built-up areas by preventing soil compaction caused by building structures, vehicular traffic, and heavy pedestrian footfall.



#### **Features & Benefits**

- High compressive load
- Strong structure
- Fully recyclable

#### **Applicable Areas**

- Carparks
- Roadways
- Footpaths
- Plazas
- Median

#### **TECHNICAL SPECIFICATION**

Material	PP
Dimension	600 (L) x 600 (W) x 400 (H) mm
Compressive strength	>300 kN/m <sup>2</sup>
Internal void volume	~95%





VersiTape® F100

#### RootGard<sup>™</sup> Root Barriers

**RootGard<sup>™</sup>** root barriers are versatile and made of extremely tough polyethylene to protect hardscapes and landscapes from damage by tree roots. When used around building foundations, RootGard<sup>™</sup> also prevents root intrusion.

The impermeable geomembrane is also ideal for golf course construction to separate the greens from invasive grass and clay soils.



#### **Features & Benefits**

- Flexible and suitable for use in irregular or difficult locations
- Manufactured from high quality lightweight polyethylene material
- Available in a range of depth and length configurations to fit all planning applications
- Cut edges can be easily joined using adhesive
- Simple and easy installation
- Resistant to biological attack and a wide range of soil borne chemicals

#### **TECHNICAL SPECIFICATION**

Material	HDPE
Depth	300, 600, 1000, 1500 mm
Thickness	1.25 ± 0.05 mm
Break strength: Machine direction Transverse direction	2600 t/m² (ASTM D638) 2700 t/m² (ASTM D638)
Break elongation: Machine direction Transverse direction	600% (ASTM D638) 700% (ASTM D638)
Tear strength: Machine direction Transverse direction	14 kgf (ASTM D1004) 15 kgf (ASTM D1004)
Puncture strength	36.5 kgf (ASTM D4833)
Hydrostatic resistance	200 t/m² (ASTM D751-A)
Multi-Axial tensile strength	1600 t/m² (ASTM D5617-A)
Elongation @rupture	20.8% (ASTM D5617-A)



#### Durability

LawnGard<sup>™</sup> is highly resistant to UV rays, weathering, and wear and tear.

#### **Easy Installation**

300 mm

LawnGard<sup>™</sup> is easy to install. Simply position the edging halfway into dug trench as desired and backfill with soil or planting media to hold in place. LawnGard<sup>™</sup> Pegs may be used to secure it into the ground.

#### Versatility

LawnGard<sup>™</sup> is flexible, allowing the creation of smooth curves and angles that fit the landscape design.

#### **Maintenance Free**

LawnGard<sup>™</sup> requires minimal maintenance. It is resistant against rust, rot, and fading, which eliminates the need for constant upkeep, and can be used in a variety of soil condition.

#### Included Pegs

LawnGard<sup>™</sup> comes with a set of durable pegs that securely anchor the edging into the ground. These pegs are specially designed to complement and support the LawnGard<sup>™</sup> in withstanding various soil conditions, providing maximum stability. With a simple yet effective design, it ensures secured positioning of the LawnGard<sup>™</sup>, even in high-traffic areas.

#### LawnGard<sup>™</sup> Professional Garden Edge

**LawnGard<sup>™</sup>** is a versatile and durable solution to create clean and defined borders for outdoor spaces. While enhancing the aesthetic appeal of lawns and garden beds, LawnGard<sup>™</sup> separates different soft and hardscapes, retain mulch and stones, and prevent grass or weeds from encroaching onto flower beds. Effectively, serving as pavement edging and a root barrier.





200 mm



LawnGard<sup>™</sup> Pegs for anchoring



#### **TrackGard®** Modular Roadway System

**TrackGard®** has excellent slip-resistance surface and its contiguous installation ensures a safe walkable path for pedestrians and a stable platform for vehicles.

Each UV-stabilised module is lightweight allowing for fast installation and dismantle times, requires minimal maintenance and is easy to clean using a high pressure washer.



#### Features & Benefits

- Modules interlock securely without any tools or fasteners
- Modules are interchangeable and expandable
- Easily installed and removed

#### **Applicable Areas**

- Access roads
- Construction sites
- Sports fields
- Event flooring
- Beach access
- Race courses

#### **TECHNICAL SPECIFICATION**

Material	PP/HDPE
Coverage	~3.7 modules/m <sup>2</sup>
Compressive strength	>2,000 kN/m <sup>2</sup>
Slip resistance (SS 485)	Wet pendulum testing: Class X Dry friction testing: Class F





#### **Evalon**<sup>®</sup> **EVA/PVC** Membrane

Evalon<sup>®</sup> membranes are of superior quality, consisting of an alloy of Polyvinyl Chloride (PVC) and a high molecular polymer elasticiser, Ethylene Vinyl Acetate (EVA) terpolymer. Both components are solids and thus form a stable membrane which remains unchanged over time, retaining its physical properties and optimising the membrane's life expectancy. The material is calendered to create a homogeneous, soft and elastic membrane, which may come with a fleecebacking depending on the application.





#### **Features & Benefits**

- Excellent thermal and mechanical properties
- Bitumen & polystyrene compatible
- Excellent vapour permeability
- FLL root and rot resistant
- Easy and quick installation
- Solid elasticisers do not vapourise or migrate, unlike liquid plasticisers

#### **Applicable Areas**

- All flat roof configurations, both concealed and exposed
- Green roofs and landscape areas
- Multi-storey car park decks
- Driveways/road







All surfaces shall be smooth and free from dust or loose materials.

The surfaces shall then be cleaned and allowed to dry before applying a thick coat of Flexiprufe® adhesive onto the substrate.

For horizontal surfaces, unroll the Evalon® V waterproofing membrane onto the Flexiprufe<sup>®</sup> while it is still tacky. Do this while applying pressure from the centre to prevent air being trapped under the Evalon® V membrane. All laps shall be a minimum of 50 mm and shall be welded together by hot air welding. The Evalon® V membrane shall be bonded and installed until the extent/ base of parapet walls/

For vertical surfaces, Evalon<sup>®</sup> waterproofing membrane shall be used. The Evalon<sup>®</sup> membrane shall be terminated at 300 mm above the structural level and



#### **Euraplan®** Polymeric UV-Resistant PVC Membrane

**Euraplan®** is a polymeric PVC-based waterproofing membrane that is reinforced with a polyester fibre mesh, to bolster the membrane's strength and elastic capabilities.

Euraplan<sup>®</sup>, attributing to the membrane's outstanding resistance to weathering and permanent UV irradiation, may be utilised as an exposed waterproofing membrane. The membrane may be installed on flat roofs and decking areas for both exposed and concealed applications.



The membrane is also suitable for concealed applications on flat roofs and decking areas.

Euraplan<sup>®</sup> boasts high resistance to ageing, tensile strength and vapour permeability, which makes it excellent for a variety of climates, and the membrane meets the fire performance standards of the European Union.

#### **Installation Procedures**

All surfaces shall be smooth and free from dust or loose materials.

Euraplan<sup>®</sup> shall be loose laid with a minimum of 50 mm lapping between membranes. Lappings shall be welded together by hot air welding.

For vertical surfaces such as parapet walls and upturn areas, Euraplan<sup>®</sup> shall be terminated at 300 mm above structural level and bonded with an approved adhesive.





NUS High School of Math & Science , Singapore

#### Bitulen<sup>®</sup> 180 APP Torch-On Membrane

**Bitulen® 180** is a non-woven polyester & glass reinforced atactic-polypropylene polymers (APP) modified bituminous waterproofing membrane, suited for use in climatic conditions with significantly higher ambient temperatures.



#### Features & Benefits

- Available in different coloured slated-coated surface
- Conforms to Singapore Standard SS374:1994
- High temperature sealing capability
- Dimensionally stable
- UV-resistant
- High static puncture resistance

#### **Applicable Areas**

- Trafficable or non trafficable flat roofing
- Inverted roofs
- Roof refurbishment
- Foundation and underground structures

#### **Installation Procedures**

All surfaces shall be smooth, dry, and free from dust or loose materials.

Bitulen<sup>®</sup> 180 installation should follow recommended practices for torch-on membranes. Care must be taken when using Bitulen<sup>®</sup> 180 in close proximity to other combustible materials, decorative coatings and other heat sensitive materials.

Bitulen<sup>®</sup> 180 is installed by melting the heat dispersible film backing and coating with a high temperature flame to create a molten flow in front of the roll. The flame of the torch should be applied at the low point where the roll meets the substrate or underlay. As the film and bitumen melt, roll the membrane forward allowing for side laps of 100 mm and end laps of 150 mm. A bead of bitumen must exude from all lap joints to ensure a uniform seal.



### Bitulen<sup>®</sup> SK374/DUO

Self-Adhesive Bituminous Membrane

Bitulen® SK374 is a SBS modified bituminous self-adhesive waterproofing membrane for below grade application with concrete, brickwork and blockwork constructions to protect building against groundwater ingress. It comprises a crosslaminated polyethylene film coated with modified bitumen.



Bitulen® SK374/DUO is available as a double-side self-adhesive membrane.

#### **Features & Benefits**

- Self-adhesive with easily removable silicone release sheet
- Impermeable to moisture
- Consistent thickness
- Superior flexibility
- Puncture-resistant with high tensile strength
- Minimum hydrostatic head resistance of 30 metres

#### **Installation Procedures**

All surfaces shall be dry, smooth, free from voids, dust, oil, loose particles, and sharp protrusions. Concrete must be cured for at least 7 days before priming with an approved high penetration bituminous primer and allowed to dry tack-free before installing Bitulen® SK374.

**Applicable Areas** 

Concrete structures

Basement walls

Tunnels

All corners shall be covered first applying a 150 mm wide strip of Bitulen® SK374 before the installation of the full width membrane. After removing the release paper, Bitulen<sup>®</sup> SK374 is then pressure bonded to the primed substrate. All laps must be at least 75 mm wide.

For floors, the installation of Bitulen® SK374 should be continued up the wall to connect with the damp-proof course in the walls. An angle fillet shall also be placed at junction and covered with a reinforcing strip prior to installing the membrane.

Bitulen<sup>®</sup> SK374 requires a protection layer of screed or polystyrene boards for slabs and walls respectively, or any other approved protection layers.

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# Polyprufe<sup>®</sup> BSW

#### Blind-Side Waterproofing Membrane

**Polyprufe® BSW** is a high-performance HDPE Blind-Side waterproofing membrane designed for applications where the waterproofing must be laid prior to the pouring of concrete. It allows for a fully-bonded waterproofing membrane to be applied to the positive-side of the building structure even where the said surface is inaccessible to application personnel.

Polyprufe<sup>®</sup> BSW is highly resistant to hydrostatic pressure, ground settlement and soil chemicals. As it forms a fully chemically bonded system, it is non water-tracking in the unlikely event of damage to the membrane. This provides long-term watertight integrity even in the most demanding of applications.

# GRI

#### Features & Benefits

- Excellent adherence to poured concrete
- Non water-tracking
- High resistance to hydrostatic pressure
- High resistance to tears and punctures
- Strong mechanical bond
- Permanently bonds to structural concrete
- No membrane protection required
- Resistant to soil chemicals
- Conforms to LTA Standards

#### **Installation Procedures**

Polyprufe<sup>®</sup> BSW shall be loose-laid adhered with the release film facing the concrete pour. On vertical surfaces, the membrane is to be mechanically fastened to the top of the blinding layer before applying subsequent layers.

Overlaps shall be 75 mm, and staggered in order to prevent a bulge from forming, and all succeeding layers must be clean and dry before application in order to ensure a strong, watertight bond.

The substrate shall be mechanically stable and not shift during concrete pouring. The substrate shall also be smooth with no gaps or voids. Any penetrations should be grouted in order to ensure stability.

Prior to concrete pouring, ensure that all plastic release films are removed. To prevent damage to the membrane, ensure that no sharp objects are used to consolidate the concrete.

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#### enefits

- Applicable AreasSubstrate basement
- Wall slabs



# Polyprufe® BSW15

#### HDPE Blind-Side Waterproofing Membrane

**Polyprufe® BSW15** is a high-performance HDPE Blind-Side waterproofing membrane designed for applications where the waterproofing must be laid prior to pouring of the concrete. It allows for fully-bonded waterproofing membrane to be applied to the positive-side of the building structure even where the said surface is inaccessible to application personnel.

**Polyprufe® BSW15** is highly resistant to hydrostatic pressure, ground settlement and soil chemicals. It is also fully mechanically bonded, making it non watertracking in the unlikely event of damage to the membrane, providing long-term watertight integrity even in the most demanding of applications.

**Polyprufe® BSW15** is a pressure-sensitive self-adhesive membrane which allows for watertight sealing of overlapping sheets. It is cold-applied and easily installed in restricted and confined spaces.

#### Features & Benefits

- Excellent adherence to poured concrete
- Non water-tracking
- High resistance to hydrostatic pressure
- High resistance to tears and punctures
- Strong mechanical bond
- Permanently bonds to structural concrete
- No membrane protection required
- Resistant to soil chemicals

#### **Applicable Areas**

- Substrate basement
- Wall slabs

Installation Procedures

Polyprufe<sup>®</sup> BSW15 shall be loose-laid adhered with the release film facing the concrete pour. On vertical surfaces, the membrane is to be mechanically fastened to the top of the blinding layer before applying subsequent layers.

Overlaps shall be 75 mm, and staggered in order to prevent a bulge from forming, and all succeeding layers must be clean and dry before application in order to ensure a strong, watertight bond.

The substrate shall be mechanically stable and not shift during concrete pouring. The substrate shall also be smooth with no gaps or voids. Any penetrations should be grouted in order to ensure stability.

Prior to concrete pouring, ensure that all plastic release films are removed. To prevent damage to the membrane, ensure that no sharp objects are used to consolidate the concrete.

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#### Euraflex™

High Performance Ethylene Propylene Diene Monomer (EPDM)

**Euraflex™** is a high-performance EPDM rubber liner that is suitable for various applications such as ponds, water features, and even concealed pitched roofs. Its high flexibility allows it to conform to various degrees of slopes and edges.



#### Eurathane® Polyurethane Coating

**Eurathane®** polyurethane coating is a cold-applied waterproofing system that can be readily and easily applied on concrete, metal, or plywood surfaces by brush, roller, squeegee, or trowel. When fully cured, the membrane has excellent flexibility, elongation, adhesion strength, and crack bridging properties.

#### **Features & Benefits**

- Low VOC
- Excellent flexibility and elongation
- Maintains a waterproof seal over a wide range of temperatures
- Easily applied to complex and irregular shapes to form a seamless waterproofing coating

#### **EURATHANE** systems are available as three different products:

• Eurathane® 2000 • Eurathane® 3000

**Preformed Membrane** 



# Eurathane® 2000

#### Moisture-Cured Single Component

**Eurathane® 2000** is a single-component, concealed application polyurethane waterproofing coating for under tile or screed application.

#### **Applicable Areas**

- Internal wet area
- Water-retaining structure (concealed and non-potable water storage)
- Lift pits, culverts and drains
- Damp-proofing in sandwich constructions

#### Installation Procedures

Eurathane<sup>®</sup> 2000 shall be applied by brush, roller, squeegee or trowel to obtain a continuous, unbroken film. It shall be applied at a rate of 0.75 litre/m<sup>2</sup>/coat. Two coats are recommended, allowing the first to fully dry prior to application of the second coat. A dry film thickness of 1.0 mm to 1.2 mm is recommended.

Extremely porous substrates shall be primed with a Eurathane<sup>®</sup> Primer prior to coating. Application must be made uniformly to avoid pin holes.

As with all waterproofing treatment, it is essential that Eurathane<sup>®</sup> 2000 is protected from mechanical damage during subsequent construction work or backfilling.

Surfaces on which Eurathane<sup>®</sup> 2000 is to be applied shall be dry, smooth, sound and free from honeycombs, protrusions, voids, laitance, dust, loose material, paint, oil, curing agent or any other contaminants. Blockwork shall be smooth rendered and brickwork flush pointed.





#### Eurathane® 3000

#### Seamless Elastomeric Waterproof Coating

**Eurathane® 3000** is a premium single-component polyurethane coating based on pure elastomeric hydrophobic polyurethane resins, which results in excellent mechanical, chemical, thermal, UV, and natural element resistance properties. To suit various design requirements, different colours and finishings are available on demand.

#### Applicable Areas

- Roof
- Balconies, terraces and verandas
- Internal and external wet areas
- Pedestrian and vehicular traffic decks
- Stairways

#### **Installation Procedures**

Eurathane<sup>®</sup> 3000 shall be applied by brush, roller, squeegee or trowel to obtain a continuous, unbroken film. It shall be applied at a rate of 0.75 litre/m<sup>2</sup>/coat. Two coats are recommended, allowing the first coat to fully dry prior to application of the second coat. A dry film thickness of 1.0 mm to 1.2 mm is recommended.

Extremely porous substrates shall be primed with a high penetration solventbased polyurethane primer prior to coating. Application must be made uniformly to avoid pin holes.

As with all waterproofing treatments, it is essential that Eurathane<sup>®</sup> 3000 is protected from mechanical damage during subsequent construction work or backfilling.

Surfaces upon which Eurathane<sup>®</sup> 3000 is to be applied shall be dry, smooth, sound and free from honeycombs, protrusions, voids, laitance, dust, loose material, paint, oil, curing agent or any other contaminants. Blockwork shall be smoothly rendered and brickwork flush pointed.



#### Fleximent<sup>®</sup> 201 Flexible Cementitious Coating

**Fleximent® 201** is a two-component, polymer-modified flexible cementitious waterproofing coating that cures by pozzolanic reaction. Fleximent® 201 meets the Singapore Standard SS375 for direct contact with potable water and is Singapore Green Label certified.

Fleximent<sup>®</sup> 201 provides excellent adhesion strength for plastering and subsequent tiling works making it suitable for wet areas.

#### Features & Benefits

- Easy to mix and apply
- Excellent adhesion to wide range of construction materials
- High elongation
- Resistant to frost and thawing salts
- Non-toxic, compatible with potable water usage

#### **Applicable Areas**

- Internal wet areas
- Lift pits
- Potable water tanks
- Storm drains, canals, water excluding structures

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#### **Installation Procedures**

Surfaces shall be clean and free from honeycombs, voids, dirt, loose material, paint, oil, curing agents, or other contaminants.

Prior to application, dampen substrate with a brush or roller.

- a. Pour Part A (liquid) into a clean container.
- b. Pour Part B (powder) slowly into Part A.
- c. Mix with a low speed drill fitted with purpose-made paddle.
- d. Ensure that mix is homogeneous and lump-free.

Apply Fleximent<sup>®</sup> 201 by squeegee, roller or brush to horizontal and vertical surfaces. Ensure that air is not entrapped in the membrane. Apply slurry with a brush at joints and corners ensuring that areas are worked and covered well. Allow curing to take place completely before applying the second coat.

Protect freshly applied surfaces from strong sunlight and drying winds with a polyethylene sheet. Cover Fleximent<sup>®</sup> 201 with protective screed immediately after curing. Exercise care to prevent damage to waterproofing during subsequent construction work prior to laying of protection screed.

Apply Fleximent<sup>®</sup> 201 in 2 coats at 1.0–1.1 kg per sq m per coat for final dry film thickness of approximately 1.2 mm.





#### **Flexicoat**<sup>™</sup>

#### Seamless Acrylic Waterproof Coating

Flexicoat<sup>™</sup> is a liquid-applied, single-component waterborne acrylic waterproofing coating for roofing applications. It forms a seamless elastomeric waterproofing membrane in an exposed or protected system.

Flexicoat<sup>™</sup> offers exceptional elongation and flexibility, capable of withstanding day-to-day fluctuations in temperature. When reinforced with a layer of fiberglass, Flexicoat has high tensile strength and prolonged durability.



#### Flexiprufe<sup>®</sup> R

#### Modified Bituminous Root-Resistant Membrane

Flexiprufe® R is a modified bituminous rootresistant membrane that prevents root penetration to protect hardscapes and structures. It provides effective and long-lasting protection while ensuring that roots are not damaged and plants remain healthy.

Compared to preformed membranes that require termination and overlapping joints at edges and around irregularly-shaped features, application of Flexiprufe<sup>®</sup> R is simpler and more efficient as a liquid coating applied onto surfaces.



#### Eurathane® 1200 SPE

#### Polyurea Hybrid Elastomer

Eurathane® 1200 SPE is a solvent-free, two-component spray applied polyurea hybrid waterproofing coating.

#### **Features & Benefits**

- Easy to mix and apply
- Excellent adhesion to wide range of construction materials
- High elongation
- Resistant to frost and thawing salts
- Non-toxic, compatible with potable water usage

#### **Applicable Areas**

- Internal wet areas
- Lift pits
- Potable water tanks
- Storm drains, canals, water excluding structures

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**Spray Applied Membrane** 



#### **Envirocrete**<sup>™</sup>

#### Crystallisation Waterproofing Admixture

**Envirocrete**<sup>™</sup> is an integral waterproofing system consisting of Portland cement, treated silica sand, and various active chemicals. Added to concrete at batching, Envirocrete<sup>™</sup> generates non-soluble crystals throughout the capillaries and pores in the concrete, creating a physical barrier to water.

#### **Features & Benefits**

#### Maximises waterproofing of concrete

- Will withstand extreme hydrostatic pressure >7 bar
- **Applicable Areas** Basements
- Tunnels
- Water tanks
- Exceptional durability at -20°C to 50°C
- Precast concrete

#### Installation Procedures

For waterproofing concrete, the recommended dosage at Envirocrete<sup>™</sup> is 0.8% -1.2% by weight of cement. For enhanced chemical resistance please consult with Elmich to determine the approximate dosage. Envirocrete<sup>™</sup> is added to the concrete at the time of batching. The sequence of procedures for addition will vary according to the type of batch plant operation and equipment. An ideal water cement ratio of <0.42, and should not exceed 0.46 to ensure Envirocrete<sup>™</sup> performs as specified.

#### Curing

Normal practices for placing and curing concrete should be followed as laid out in your local standards.

## **Envirocrete<sup>™</sup>S**

#### Crystallisation Waterproofing Slurry

Envirocrete<sup>™</sup> S is a surface applied waterproofing system consisting of Portland cement, treated silica sand, and various active chemicals. Envirocrete<sup>™</sup> S penetrates the concrete and provides a permanent waterproofing protection layer.

#### Features & Benefits

- Maximises waterproofing of concrete
- Will withstand hydrostatic pressure >3 bar
- Exceptional durability at -20°C to 50°C
- Reduces shrinkage and cracking

#### **Applicable Areas** Basements

- Tunnels
- Water tanks
- Precast concrete

#### Installation Procedures

Surfaces should be clean, free from honeycombs, voids, dirt, loose material, paint, oil, curing agents, or other contaminants.

Prior to application, dampen substrate with a brush or roller.

- a. Use 5 parts Envirocrete<sup>™</sup> S to 2 parts water by volume.
- b. Mix with a low speed drill fitted with purpose-made paddle.
- c. Ensure that mix is homogeneous and lump-free.

Apply two coats of Envirocrete<sup>™</sup> S using a masonry brush or appropriate power spray equipment. Apply the second coat whilst the first coat is still "green". During the curing period the Envirocrete<sup>™</sup> S treatment must be protected from rainfall and water puddles. Consumption of two coats is approximately 1.5 kg/m<sup>2</sup>.





#### VersiTape® F100

Self-Adhesive Butyl Tape with Fleece

**VersiTape® F100** is a self-adhesive sealing tape comprising a butyl rubber compound and polypropylene fleece. VersiTape® F100 has excellent adhesion and stability at high and low temperatures, and its plasticity enables it to conform to edges.





#### Features & Benefits

- Self-adhesive and self-sealing
- Excellent heat stability
- Solvent free

#### **Installation Procedures**

Prepare the surface and proceed as follows:

- The surface shall be clean, dry, smooth, and dust-free
- Unroll the tape until the desired length is reached
- Remove the silicone release film that covers the adhesive part of the tape and position VersiTape<sup>®</sup> F100
- Press with a roller or a cloth pad

# **Joint Sealing Material**

Applicable Areas

 Seal joint between floor slab and wall under wet areas

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#### VersiDrain<sup>®</sup> P-Anchor<sup>®</sup>

Under Screed Efflorescence Drainage Mat

**VersiDrain® P-Anchor®** is a lightweight drainage sheet that is positioned between the structural slab and topping screed for laying tiles.

It acts as a separation layer between the cement, sand screed, and the floor slab, creating a drainage and ventilation cavity that allows entrapped water in the screed to escape via perforations in the sheet.



#### Features & Benefits

- Minimises efflorescence & algae
- Reduces surface cracking & frost expansion
- Protects waterproofing membranes
- Efficient drainage under screeds

#### **Applicable Areas**

- Balconies & terraces
- Podium decks
- Swimming pool decks
- Patios
- Changing & wash rooms

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#### VersiDrain<sup>®</sup> EC

#### Thin-Bed Efflorescence Drainage Sheet

**VersiDrain® EC** is a low profile composite drainage sheet used in conjunction with Bitulen® SK374 and VersiTape® F100 in the VersiDrain® Waterproofing System.

Designed for use on thin-bed cement mortar such as those in stairs, the System mitigates efflorescence by creating a separation gap between the finish layers and the base structure. This relieves entrapped moisture within the cement mortar.

**Applicable Areas** 

• Green roof drainage

• External basement wall

#### Features & Benefits

• Time-saving

#### High compressive strength

• Efficient drainage





## **Delta® Terraxx**

**Delta® MS Drain/Terraxx** is a HDPE dimple sheet with factory welded polypropylene geotextile manufactured from 100% virgin material. It is used primarily around basement walls for surface drainage, protection of waterproofing membrane, and relief of hydrostatic pressure. It is tested in accordance to both the German DIN and British EN standards.

#### Features & Benefits

- High compressive strength
- Permanent-filtration drainage
- Protects waterproofing system



#### Applicable Areas

• External basement wall

DELTA TERRAXX

• Green roof drainage





#### Delta® MS/MS-20

**Delta® MS/MS-20** is a HDPE dimple sheet manufactured from 100% virgin material without plasticizer and is fully recyclable. It is tested to German Standard DIN 18195 and fire resistance standard DIN 4102.

#### **Features & Benefits**

- High compressive strength
- Non-polluting

MADE

IN

GERMANY

- Rot-proof and non-degradable in soil
- Flat overlapping edges for precise-fitting joints



- Sub-base course under concrete floor slabs
- Foundation wall protection
- Seepage layer in cavity wall





### Delta<sup>®</sup> PT

**Delta® PT** is a ventilated HDPE dimple sheet manufactured from 100% virgin material and is incorporated with a bonded twist-woven mesh. It is used internally for water management and elimination of damp or leaking walls. Its slim and efficient profile creates an air gap to isolate damp, salt affected and leaking walls.

#### **Features & Benefits**

- High compressive strength
- Rot-proof and free of recycled material
- Non-polluting





# Sustainability In Our Products

Elmich urban greenery products help our customers achieve their eco-friendly goals in every phase of a building's lifecycle from design to maintenance. Our products contribute to green building certifications as we strive towards sustainable growth and modernisation. "Our vision is to provide sustainable building solutions to **create cities, where urban meets nature.**"



# What Sets Us Apart From The Rest?



#### **Product Management**

Elmich aims to deliver environmentally-safe, innovative, and cost-effective urban greening solutions to our customers worldwide.

Every aspect of our business, from research and development to supply chain management is centrally coordinated, ensuring the delivery of a well-engineered and tested product.

#### GREEN TECHNOLOGY AWARDS: TOP HONOUR A track record of innovation

Elmich has invested heavi In developing sustainable products that reduce cost

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#### **Innovative Spirit**

Our commitment towards sustainable green building drives us towards constant innovation and improvement of our products to deal with the everchanging requirements of the industry.

#### **Green Today for a Better Tomorrow**

We are conscious and proud of our unique role in co-creating a sustainable planet. Green label certified products using 100% recycled plastics is just one of the ways we reduce our carbon footprint.

#### Member of Green Building Councils

Elmich affirms its commitment towards green and sustainable building efforts through its membership in both the US and Singapore green building councils.



#### Green Certifications

Elmich's products are awarded with Green accreditation from Singapore Environment Council or Singapore Green Building Council, as well as Australia's Ecospecifier accreditation.

#### **ISO 9001 Certification**

Elmich assures its clients of high quality products and services.

#### **Business Continuity Management**

Elmich has been certified Business Continuity Management (BCM) ready according to ISO 22301 standard since November 2011. This means business as usual for our customers even in the event of a crisis.







#### Elmich: Singapore Brand. International Network.

We are a leader in ecologically-minded urban landscaping, waterproofing and stormwater management solutions. Through a network that spans 30 countries in 6 continents, Elmich is committed to delivering innovative and sustainable building solutions to developers, architects and builders worldwide.

Since our founding, Elmich has always understood that every project and customer is different. To achieve this, we have established a dedicated research team focused on the design and testing of highly-customised solutions for the built environment. We have accumulated numerous registered designs and patents for proprietary Elmich products through the years – a testament to our expertise and technical know-how. In spite of this, Elmich quality assurance processes are still continuously reviewed and refined for our customers, partners and the communities that we serve.

#### **Elmich Pte Ltd**

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