



SwellSeal MS/HP

BENTONITE GEOTEXTILE WITH BONDED POLYETHYLENE LINER

SwellSeal MS is an advanced waterproofing membrane designed for below-ground applications. **SwellSeal MS HP** consists of a low permeability membrane manufactured from two high-strength geotextile fabrics, 5,500 grams of high quality granulated sodium bentonite per square metre, plus a PE waterproof liner bonded to the nonwoven geotextile. The PE liner provides superior chemical resistance and extremely low permeability for water vapour and gas transmission. Needle punching with fine American needles delivers a high strength interlocked geotextile fabric that binds the high swelling, low permeability sodium bentonite between the two geotextile. When hydrated this results in an impervious membrane that will be maintained for the life of the structure.

SwellSeal MS HP is a highly effective waterproofing membrane ideal for below-grade vertical and horizontal foundation surfaces. Designed and specified by one of Australia's most experienced waterproofing companies **SwellSeal MS** is manufactured from all new materials by one of the largest textile companies in China under an ISO9001: 2000 Quality Assurance Program ensuring the quality, uniformity and robustness of the liner. Installation is fast and easy, requiring no primers or special tools. **SwellSeal MS** can be installed in virtually any weather, including high temperatures and dry conditions.

When concrete poured against it **SwellSeal MS** forms a strong mechanical bond as the geotextile fibres are locked into place. Independent laboratory testing conducted in accordance with ASTM D-903 (Peel Adhesion to Concrete) this performance feature is especially important for under slab and property-line construction where the product is installed prior to the structural concrete being placed.

SwellSeal MS works by forming a low permeability membrane upon contact with water. Upon hydration, unconfined bentonite can swell up to 15 times its dry volume. When confined under pressure the bentonite swells, forming a dense, impervious waterproofing membrane. The swelling action of the **SwellSeal MS** self-seals small cracks caused by ground settlement, concrete shrinkage, or seismic action – problems over which there is normally no control. This swelling action also occurs in saline environments.

Over 150 million square metres of bentonite liner has been successfully installed on projects worldwide. With the specification & design experience and the technical capacity of one of the largest textile companies in China, you can be assured of a waterproofing system that works.

Bentonite Sales Australia

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APPLICATIONS

SwellSeal MS is designed for below-ground vertical and horizontal structural foundation surfaces. Typical applications include backfilled concrete walls, structural slabs, tunnels, and property line construction. Property line construction applications include piling, skin wall, shotcrete and stabilised earth retention walls. Applications may include structures under continuous or intermittent hydrostatic pressure. **SwellSeal MS** is particularly useful where the ground water is slightly saline or contaminated.

SwellSeal MS can be installed directly over a properly prepared soil substrate without a working mud slab. Additionally, **SwellSeal MS** can be installed onto freshly poured concrete as soon as the forms are removed.

Features and Benefits

- Durability: withstands inclement weather and resists construction-related damage
- Superior Adhesion: mechanical bond secures product and prevents water migration
- Long Service Life: provides waterproofing protection for the life of the structure
- Easy to Install: quick and easy installation without adhesives or special equipment
- Self-Sealing: active, swelling properties of sodium bentonite seal small cracks, including in saline environments.
- Uniformity: minimum 5500 grams of sodium bentonite granules per square metre
- Insured Warranty: Manufacturers warranty

Technical Specifications

Property	Test Method	Typical Value
Bentonite Mass Per Unit Area (g/m ²)	ASTM D 3776	5500
PE Membrane thickness (mm)		>=0.20
Peel resistance to Concrete (N/10 cm)	ASTM 4632	>=40
Hydrostatic Pressure Resistance (m)	ASTM D 5385	
	ASTM D 5084	
Permeability (cm/sec)	ASTM D 5084	4.5 x 10⁻¹²
Grab Tensile Strength (N)	ASTM D 4632	
Puncture Resistance (N)	ASTM D 4833	
Water Vapour Transmission Rate per hour	ASTM E 96	
Size of roll	100 m ²	5m X 20m
Shipping quantity per 20 GP (rolls)		32

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INSTALLATION

GENERAL

Install **SwellSeal MS** in strict accordance with the manufacturer's installation guidelines. Install **SwellSeal MS** with the grey (woven) geotextile side against the concrete to be waterproofed. Install Bentonite paste in all applicable horizontal and vertical concrete construction joints. Schedule waterproofing material installation to permit the prompt placement of the backfill material or concrete. To comply with warranty requirements SwellSeal waterstops are to be used in all construction joints, please consult your applicator for recommended accessory products such as bentonite granules etc.

SwellSeal MS is not designed to waterproof expansion joints without a properly engineered expansion joint system to be used in conjunction with **SwellSeal MS**, please consult your local representative or email us at info@bentonitesales.com.

STORAGE

Store **SwellSeal MS** and all accessory products in a dry shelter. If stored outside, protect the liner with a weatherproof cover on all sides and on top. Ensure that the bentonite liner avoids contact with ground surface water.

PREPARATORY WORK

The substrate should be smooth and compacted to a minimum density of 85% Modified Proctor. Concrete surfaces should be free of voids and sharp projections. Surface irregularities should be removed before installation. Honeycombing and other surface voids must be filled with mortar or Bentonite Sealant, and tie-bolt holes must be filled with non-shrink mortar/grout.

UNDER CONCRETE FLOOR SLABS

SwellSeal MS is recommended for use under structural reinforced concrete slabs 150 mm thick, or greater, over a compacted earth/gravel substrate, or 50 mm lean-mix concrete. Install **SwellSeal MS** around all foundations (ground beams pads, pile caps etc). Place **SwellSeal MS** over the properly prepared substrate with the grey (woven) geotextile side facing the concrete to be waterproofed. Overlap all adjoining edges a minimum 100 mm and stagger ends a minimum 300 mm. Staple or nail edges together as required to prevent any displacement before and during concrete placement. **SwellSeal MS** should not extend into foundation bearing planes (i.e. pile caps, ground beams, pads etc.,) but should completely envelop them. Where this is not possible / desirable a cementitious waterproofing sealant can be used as a continuity 'membrane' through the bearing plane, to which **SwellSeal MS** can be sealed using a 100 mm lap, incorporating a 5 mm X 50 mm fillet of Bentonite Sealer.

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SwellSeal MS is cut to provide a snug fit around all relevant objects (pipes, piles etc). Place a 40 mm fillet of Bentonite Granules or Bentonite Paste (granules & water) around the penetration on top of the **SwellSeal MS**. Where concrete a under blinding is not used, add an additional 50 mm border of Bentonite Granules around the penetration under the **SwellSeal MS**. Where property line construction, such as secant / contiguous piling, metal sheet piling, skin wall etc., is used as the outside concrete form, continue the under slab **SwellSeal MS** installation up the property line a minimum 250 mm above the top edge of the finished floor slab foundation, or kicker level. The extra 250 mm is very important since there is no access to the outer edge after the concrete pour, and the top 100 mm needs to be kept free of concrete splashes to enable a clean lap later.

BACKFILLED CONCRETE WALLS

SwellSeal MS can be applied to backfilled walls in two ways: mechanically fastening to cast concrete just prior to backfilling (post-applied), or preferably, by utilizing the peel-adhesion properties of the **SwellSeal MS** (pre-applied).

The needle-punched geotextile fibres, which have been forced from the non woven side through the bentonite and the grey (woven) side, will be trapped within the wet concrete. These allow the **SwellSeal MS** to remain firmly attached to the concrete after the formwork has been removed.

Concrete tie holes, etc., must be filled, from the outside, using a proprietary non-shrink grout or similar, covered in a 'mushroom' of Bentonite Paste or Bentonite Sealant, either prior to **SwellSeal MS** (post-fix) application, or prior to backfilling (pre-fix/peel-adhered application), where additional **SwellSeal MS** patching will be required.

Detail all pipe penetrations with SwellSeal Waterstop as a 'puddle flange' within the concrete, ensuring no less than 75 mm concrete cover to all sides, and where penetrations pass through **SwellSeal MS**, ensure that **SwellSeal MS** is cut to provide a snug fit, and detail with a 40 mm X 40 mm fillet of Bentonite Paste (granules & water) or Bentonite Sealant, prior to backfilling.

Backfill material shall be compactable soils and free of construction debris. Backfill shall be clean, well grounded, and compacted every 300mm to 85% modified proctor (as defined by ASTM 1557), and meet these general specifications:

- No rocks, stones or boulders larger than 50 mm
- 90% minimum soil particles smaller than 5 mm
- 10% maximum soil particles finer than 74 micron (200 mesh)

Terminate **SwellSeal MS** 100 mm below ground level with a Swell-Seal termination bar or similar apply a liquid membrane (single pack polyurethane) to overlap the termination bar and continue to grade. The **SwellSeal MS** lap should be enhanced by the inclusion of a 5 mm X 50 mm fillet of Bentonite Sealant, centrally located.

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PROPERTY LINE CONSTRUCTION

SwellSeal MS is used to waterproof various types of property line construction, including metal sheet piling, secant and contiguous piling, skin wall, shotcrete and stabilized-earth retention walls. Shotcrete can be applied directly against **SwellSeal MS**. Concrete surfaces shall be free of large voids or projections. Voids, pits, and cracks in excess of 20 mm, shall be levelled flush using cement grout, bentonite sealer or bentonite paste (granules & water). Projections greater than 20 mm shall be removed or smoothed flush. Generally, gradual undulating surfaces are acceptable, sudden changes in level, i.e. ridges and hollows, are not. When working against the property line, always start with the vertical installation, prior to installing **SwellSeal MS** under slab. Apply the bottom run of **SwellSeal MS** lengthways/horizontally against the property line, approximately 1,100 mm from the substrate/blinding level, allowing 150 mm of **SwellSeal MS** to extend under the slab. On profiled property line (metal sheet piling, secant and contiguous piling, etc) the 150 mm base 'flap' will need to be cut and splayed as necessary, to allow the material to lay flat.

LIMITATIONS

Horizontal installation surfaces shall be free of excessive standing water, particularly where a concrete blinding is not utilised.

SwellSeal MS is not designed for unconfined above ground waterproofing applications or below-ground masonry block foundation walls. **SwellSeal MS** is engineered for use under reinforced structural concrete slabs of 150 mm thick or greater. Do not install **SwellSeal MS** in horizontal split-slab, plaza deck and roof applications that will receive a poured concrete wear surface or other solid topping.

SwellSeal MS is not designed to waterproof expansion joints. Expansion joints require a properly engineered expansion joint sealant product, please consult your local representative or email us at info@bentonitesales.com.

SIZE & PACKAGING

SwellSeal MS is supplied in rolls 2.5m wide by 20 m on cardboard tubes and packed in polythene wrappers for protection or we can supply according to our customer's requirements.

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