

Waterproofing

Waterproofing Solutions from Rawell



Pre-hydrated, High Density Bentonite

RAWMAT® HDB Membranes and
RAWSEAL® HDB Waterstops
High Density Bentonite Waterproofing
Solutions



Waterproofing

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Providing leading-edge solutions

Rawell Environmental Limited is one of the world's premier suppliers of bentonite-based waterproofing materials for structural waterproofing, landscaping, environmental protection and petrochemical lining applications.

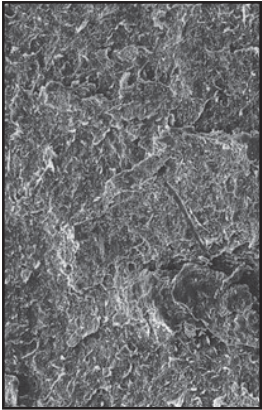
Our unique system of RAWMAT® HDB (High Density Bentonite) Membranes and RAWSEAL® HDB Waterstops delivers leading-edge solutions that offer a demonstrable range of advantages over conventional dry bentonite and other rival systems.

Founded in 1976 by current Chairman, Bryan Flynn, Rawell has built its success on years of experience in this market and a highly focused and proactive approach. Our high-quality personal service and close attention to detail have won us an enviable international reputation. Rawell's customers enjoy total reassurance that our products will function with complete reliability for the whole life of the projects for which they are specified.

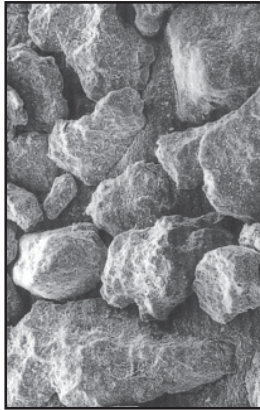
Rawell waterproofing systems have been proven internationally across a range of applications, including electricity substations, burial pits and tank farms.

The efficiency, flexibility and resistance to contamination offered by our products have led to them being specified by oil companies, chemical manufacturers and liquid storage facilities of all sizes all over the world, with specific feature projects in China, Italy, Malaysia and Scandinavia as well as the UK.

Satellite view of Wyoming, USA



Note dense surface of Pre-hydrated High Density Bentonite



Dry Bentonite, note voids around particles

What is Bentonite?

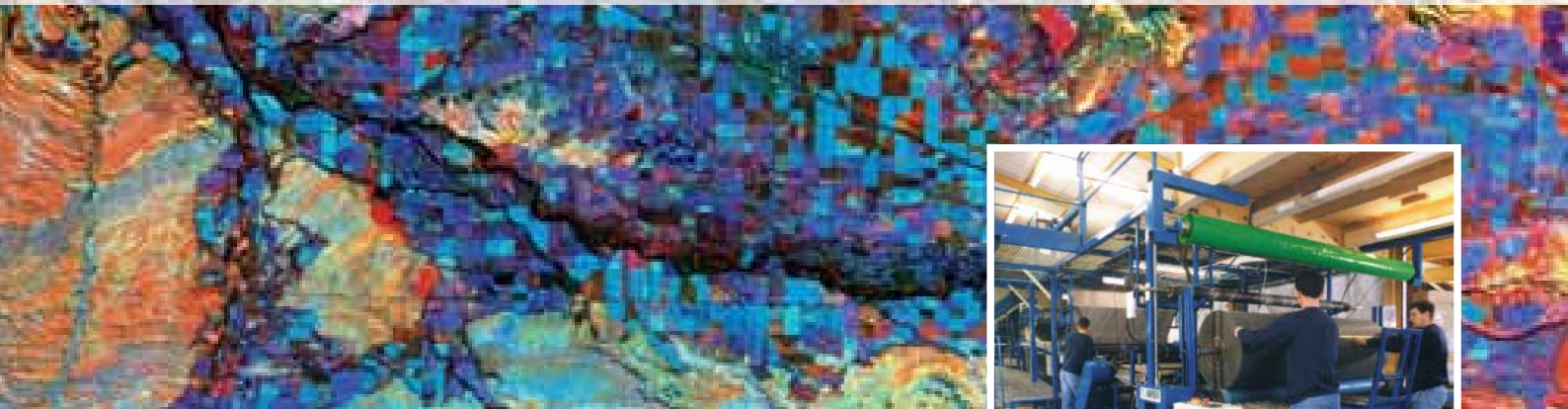
Bentonite is a natural inert clay formed from volcanic ash and found predominantly in Wyoming, USA. It absorbs water and can swell to form an impermeable mass that prevents the passage of liquid, these swell characteristics are harnessed to provide waterproofing properties.

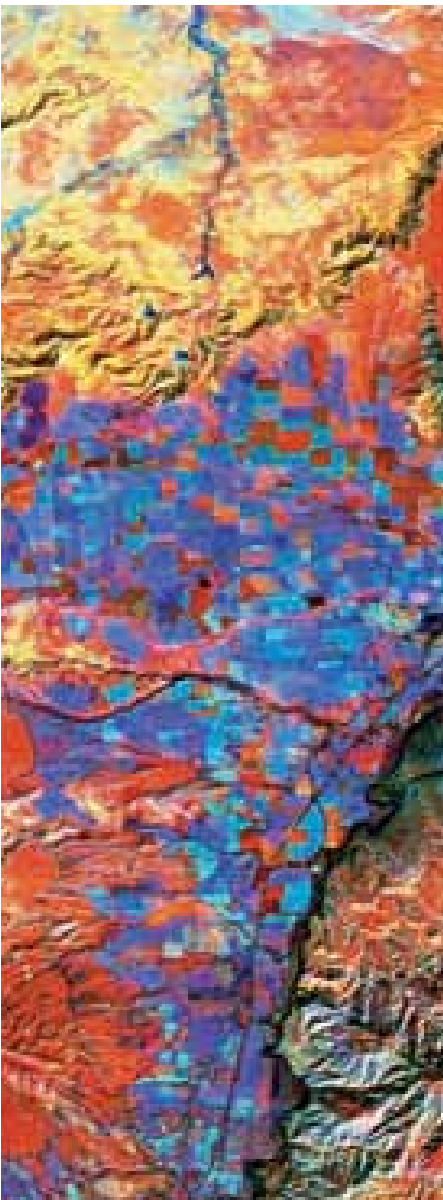
However, in-situ hydration of bentonite may leave the clay susceptible to chemical degradation.

Cracking and shrinking can be induced by ground contaminants and are well-known results of failure in dry bentonite systems.

To avoid this, Rawell has developed a revolutionary waterproofing material by using its own patented process to polymerise and pre-hydrate the bentonite. The clay is produced into rolls of membrane and lengths of waterstops.

The resulting pre-hydrated bentonite clay has extreme high density with exceptional resistance to ion exchange and chemical attack. The plasticine-like core also ensures no movement of clay in handling and no loss of the bentonite in cutting around penetrations. It also withstands minor movement through its ability to swell and ensure the continuity of the waterproofing system. This is what makes RAWMAT® HDB unique.





A unique range of benefits

RAWMAT® HDB has been developed through extensive research and experience over many years to overcome the difficulties experienced when using other waterproofing systems for petrochemical lining applications.

This unique product ensures long-term protection in a range of highly demanding ground conditions whilst affording simple and highly cost-effective installation.

As well as its long list of advantages over conventional dry bentonite systems, RAWMAT® HDB also affords a range of specific benefits when compared with compacted clay, thermoplastic membranes and concrete.

The natural sodium bentonite in RAWMAT® HDB membranes is pre-hydrated with a patented polymer solution which provides a permanent protection to the ionic fingerprint of the clay. This protects it from exchange and subsequent breakdown in ground contaminants and thus overcomes a major drawback widely associated with other bentonite systems.

As a result RAWMAT® HDB provides the reassurance of a long-term barrier to a wide variety of contaminants, hydrocarbons and chemicals. It is equally effective whether used to prevent contamination reaching unpolluted water or to contain contaminated materials in order to protect the surrounding environment. Because the geotextile carriers have been carefully chosen, intimate contact between the membrane and other materials in a composite lining is ensured, thus preventing the tracking of liquid. Joints are self-sealing at the overlap, with no wicking of liquid either here or through the

geotextile carrying fabrics. Tracking of liquid is also eliminated because these specialist fabrics are carefully chosen to ensure the bentonite achieves an intimate seal with the structure.

Practical and cost-effective

RAWMAT® HDB comes in rolls which are easy to handle and can be installed quickly and simply by unskilled labour and in any weather. It also offers consistent quality and is flexible and robust when faced with the conditions of day-to-day site construction.

A vital advantage is the dramatic cost saving - and lower environmental impact - it offers over clay systems through its ease of handling and transport. Thanks to the low permeability of the membrane, a single truck load of RAWMAT® HDB can replace as much as 2,800 cubic metres of clay.

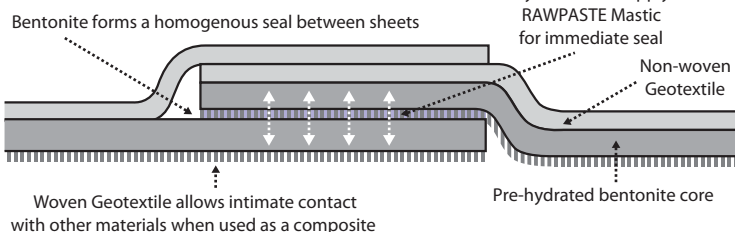
Pre-hydrating the bentonite ensures an immediate seal to hydrocarbons once joints are treated with RAWPASTE Mastic.

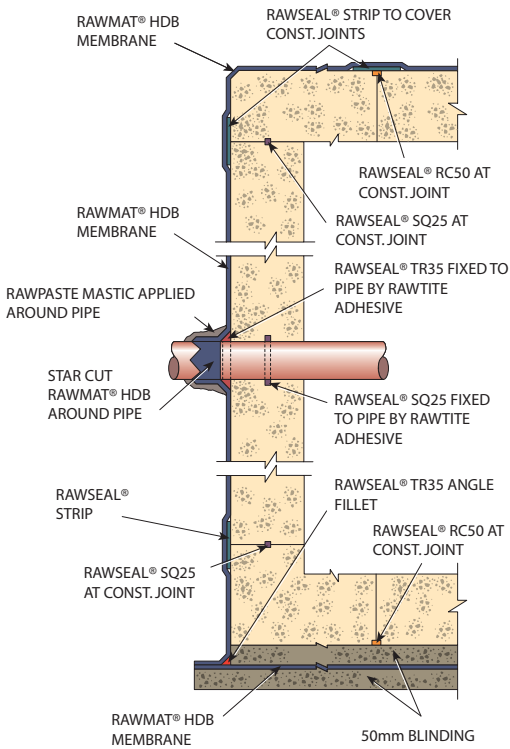
RAWMAT® HDB also avoids the need for sand blindings below the membrane or sand cushions above, while protective geotextiles are not required. In addition, the use of RAWPASTE Mastic and RAWSEAL® TR35 fillets ensures extremely simple sealing of vents, pipes, stanchions and sumps without the need for complex and expensive accessories.

RAWMAT®

Membranes

RAWMAT® HDB - Type P





Landscaping Solutions

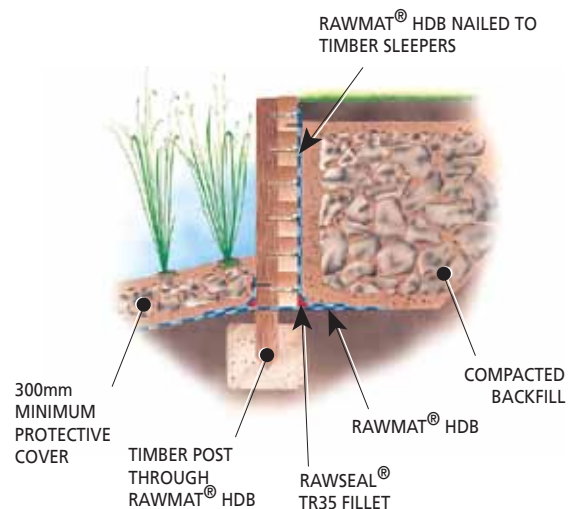
- Easy installation, simple overlaps
- Minimal preparation prior to laying
- Self sealing and highly puncture resistant
- Effective alternative to plastics or compacted clays
- Attractive edge detailing
- Rapidly establishes to form natural appearance
- Non-toxic and inert - eco friendly
- Functions effectively with dirty water and run-off

... see our **Landscaping Solutions brochure for more information**

Structural Waterproofing

- Low installation cost
- No priming or curing needed
- Simple installation
- Self sealing if punctured
- 'Intelligent' system maintains seal if structure moves
- Gas proof barrier
- Highly resistant to chemicals and hydrocarbons
- BBA accredited system

... see our **Structural Waterproofing brochure for more information**



Waterproofing Solutions from Rawell



Sealing made simple

RAWSEAL® waterstops have numerous applications as a standalone swellable waterstop in Structural Waterproofing. It is also used as an accessory to the RAWMAT® HDB membrane to provide additional security in many situations.

The RAWSEAL® range of pre-hydrated natural sodium bentonite hydrophilic waterstops are designed to replace the passive PVC/Rubber waterstops which rely on being cast and interlocking into the concrete. In doing so RAWSEAL® also replaces the need for special joint pieces, split-forming and seam welding, providing an altogether simpler form of construction.

Hydrophilic waterstops are effective in that they work on the principle of forming a compressive seal within the concrete in the event that water travels along the joint or through the concrete and activates the bentonite to induce expansion.

RAWSEAL® has been successfully independently tested to greater than 40 metres hydrostatic pressure. All bentonite waterstops except RAWSEAL® use additional materials as binders, and as a result performance is limited by these additional materials or the liquids activating the profile.

RAWSEAL® profiles contain only pre-hydrated natural sodium bentonite and have the ability to perform their swelling and sealing function in a wide range of hydrating fluids whilst still allowing extrusion of the bentonite into the smaller cracks preventing the passage of liquid.

RAWSEAL® is manufactured by vacuum extrusion producing light-weight flexible coils and bars that are easily handled by an operative working

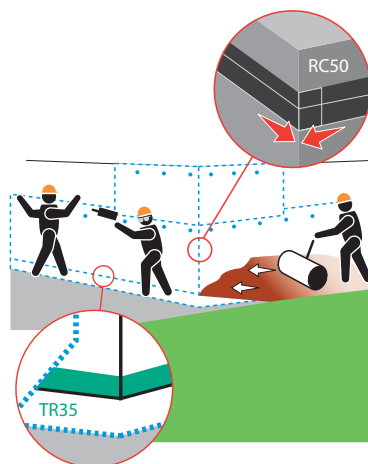


alone. Lengths are joined simply by splice jointing the two ends together (not overlapped) to form a continuous length of waterstop.

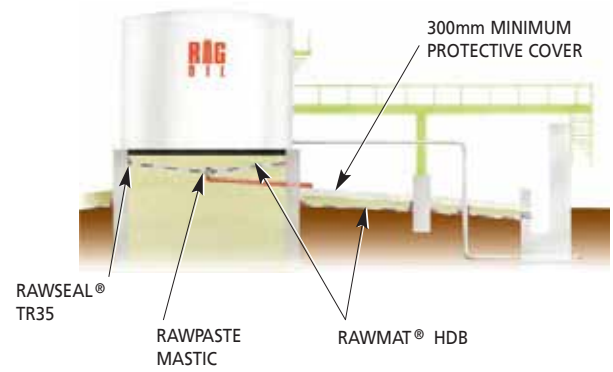
Applications for the materials include both horizontal and vertical non-moving concrete construction joints, new to existing concrete construction, irregular surfaces and around through wall penetrations as a replacement to a puddle-flange. In addition the RAWSEAL® profiles can be used to seal piles and steel posts adjoining or passing through slabs and walls.

RAWSEAL® waterstops are designed for reinforced structural concrete with a minimum 3000psi compressive strength. The RAWSEAL® CJ2025, SQ25 and RC50 profiles are designed for 200mm thick or greater concrete between two rows of reinforcing steel. Other profiles are available for thinner concrete. Consult Rawell for guidance or to discuss the custom production of waterstop profiles to meet project specific requirements.

RAWSEAL®
Waterstops



For details of Rawell products and services visit www.rawell.com where you can find more information suited to your specific needs, or call +44 (0) 151 632 5771



Environmental Protection

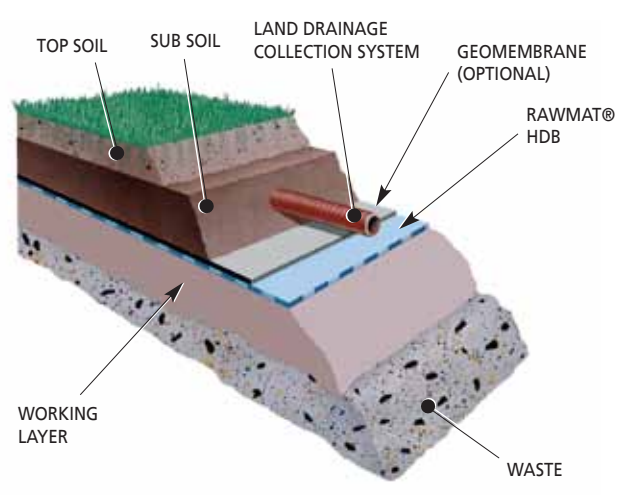
- Effective as a single or composite barrier
- Long-term stability for containing leachates, making RAWMAT® HDB ideal for brownfield and landfill applications alike
- Replaces up to 1000mm of compacted clay in landfill applications
- Simple overlaps allow very fast, cost-effective installation
- Resistant to cation exchange
- Can be installed in all weather conditions
- Permeability of 1×10^{-12} m/sec

... see our **Environmental Protection brochure for more information**

Petrochemical Lining

- Offers huge cost savings over concrete
- Retrofit: Bund Floors relined using strip, lay, replace - minimal handling
- Can be laid on contaminated sub-base - no removal to landfill
- Can be covered with existing materials on bund floor
- Areas > 1000m² can be laid and covered in 1 days operation
- No need for design of costly construction or movement joints
- Fixes direct to concrete structures
- Is buried and requires no additional maintenance

... see our **Petrochemical Lining brochure for more information**



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Rawell actively seeks close involvement with engineers, contractors and clients throughout the project, from feasibility study to final construction. We are able to provide expertise born of wide experience to help resolve difficult or complex application problems at any stage.

Rawell reserves the right to change product specification and instructions without notice. The information contained herein is to the best of our knowledge, true and accurate; it is of an illustrative nature only and does not form any contract or intended contract with any purchaser or installer, and supersedes previous information.

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