LIQUID BOOT®

SPRAY APPLIED WATER & GAS PROOFING MEMBRANE

Description

Liquid Boot® is a two component spray applied system designed specifically to quickly and permanently seal contaminated sites prior to construction. These sites, typically referred to as Brownfield sites, include landfills, reclaimed land, converted petrol stations, dry cleaners, etc.

Liquid Boot seals and protects against potential exposure from gases including methane and chemical contamination from industries such as chemical and petroleum production and storage.

Advantages

1. When applied the product completely covers all protrusions such as venting, pipe work, steel work, concrete protrusions such as columns, pads, etc. This is almost impossible using sheet materials such as HDPE, butyl rubber, polypropylene, bentonite liners, etc. The problem with sheet materials is not one of the material itself, which at least in the cases of HDPE, LLDPE and polypropylene, can be excellent. The problem with all sheet materials is the integrity of the product when fastened to walls, footings and protrusions.
2. Liquid Boot is fast to install. The biggest problem facing construction over contaminated sites is the time it can take to install a sheet material which meets specification. As installation of sheet materials can often take weeks or months and deployment is restrained by weather conditions and restricted by site preparation.
3. Liquid Boot can be applied to any surface type including service channels, below footings, above footings, walls, etc. The very types of surfaces which make other methods extremely time consuming to perform.
4. A single Permathene installation crew is able to install 800 m^2 per day over any type of prepared site. As the speed of installation is unrestricted by protrusions and contours, an accurate cost of construction can be estimated by the QS. This is almost impossible when using sheet methods which will create friction between owner and specifier.

About Liquid Boot

Liquid Boot is a 25 year old solution manufactured in Santa Ana, Orange County, California which has been proven by time. The county of Los Angeles Department of Public Works, which has one of the most stringent environmental codes in practice, has approved Liquid Boot as an effective methane gas barrier and by Los Angeles City for use as gas protection and below grade waterproofing. The US Navy has approved Liquid Boot for its installations worldwide.

The product is a chloroprene modified asphaltic (CMA) emulsion. Both components are waterborne and are cold-spray applied forming a seamless, single course membrane which forms a complete waterproofing and gasproofing system and applicable in large scale industrial applications as well as smaller residential.

Settled product forms a black in colour seamless cured film thickness of approximately 2 mm (dependent on technical requirements). Formulas are proprietary, but consist generally of the “A Product”, a proprietary polymer modified bituminous substance and the “B Product”, a proprietary catalyst. The 2 products are cold sprayed at an 8 : 1 ratio determined by a specialist installation crew.

Approvals

Liquid Boot® has been approved by the Auckland City Council as a product for below-grade waterproofing and gas barrier, and by, CSIRO (Australia) and the US Board of Building and Safety Commissioners as liner for canals, ponds and reservoirs for repairs and construction, brownfield (contaminated site) and landfill liner and gasproofing membrane as well as waterproofing of decks, roofs, retaining walls and balconies.

Permathene Ltd is the only New Zealand Liquid Boot approved supplier and applicator.

Permathene installation crew at former brownfield site, Abbots Way, Auckland, New Zealand (2006, 2007)

1. Liquid Boot application, walls, ground
2. Stormwater manholes
3. Smoke testing of floor area
4. Thickness testing

LIQUID BOOT®

Belowgrade: Underslab, Blindside, Exterior Walls

Underslab Waterproofing Liquid Boot®

Underslab Waterproofing System is designed to handle the most difficult challenges. Application of the Liquid Boot® waterproofing system is a simple process. A geotextile fabric is laid onto the prepared subgrade, such as crushed stone, soil, mudslab or another geotextile fabric. Liquid Boot® is then spray applied onto the geotextile fabric to the specified thickness. After the membrane has fully cured and has been thoroughly inspected, Liquid Boot UtraShield P-150 is applied as a protection course prior to the installation of reinforcing steel and concrete.

Fully Adhered and Fully Sealed Membrane

As a spray applied membrane, Liquid Boot® offers an efficient and effective underslab waterproofing system. Liquid Boot® is sprayed directly onto pipe penetrations and other protrusions such as footings, grade beams and pile caps to create a water tight seal.

Over 25 Years of Proven Performance

Liquid Boot® has a long tradition of successfull waterproofing applications with proven performance.

Permathene's technical experts design the membrane system with custom details and specifications. Permathene works with architects, engineers and contractors in the design of various membrane systems.

Blindside Waterproofing

The Liquid Boot® waterproofing system is designed and engineered to provide the most effective blindside waterproofing protection available today. The Liquid Boot® system is cold-spray applied directly onto lagging by first installing a drainage layer and a geotextile fabric onto the lagging, and then applying the Liquid Boot onto the geotextile. The "blindside" wall is then poured directly onto the Liquid Boot® membrane. Liquid Boot® can be applied directly onto sheetpile or shotcrete shoring. As with lagging wall applications, the wall is then poured directly against the Liquid Boot® membrane. With the Liquid Boot® system you can now effectively envelope the entire below grade structure from the positive side and protect it from the damaging effects of water.

Adheres to Concrete Walls

Concrete or shotcrete is applied directly against the Liquid Boot® waterproofing membrane and will adhere once the concrete or shotcrete is fully cured.

Applicable for Sheetpile

Liquid Boot® can be applied directly to sheetpile without having to build "false forms" or puncture through the sheetpile to secure the waterproofing.

Versatile and Functional

The Liquid Boot® system is designed to accommodate the irregularities of lagging, sheetpile, shotcrete and other surfaces. It is a single monolithic membrane system without cumbersome mechanical overlaps or attachments of dissimilar materials.

Exterior Wall Waterproofing

Spray Applied For Efficient Application

The Liquid Boot® membrane bonds directly to concrete, block wall and other substrates. As a spray applied system, Liqid Boot can be applied quickly and easily and is designed to handle common irregularities in the substrate.

Seamless, Monolithic Waterproofing Membrane

The Liquid Boot® system offers all the benefits of an adhered, spray applied, seamless waterproofing membrane.

No VOCs or Solvents

Liquid Boot® is water based, has no fumes, no VOCs and no solvents. Liquid Boot® is the product of choice for any project where water tightness and sensitivity to the environment is an objective.

LIQUID BOOT TECHNICAL	TEST METHOD	VALUE
GAS VAPOR MEMBRANE		
Hydrogen Sulfide Gas Permeability	ASTM D1343	None Detected
Benzene, Toulene, Ethylene, Xylene, Gasoline, Hexane, Perchloroethylene (tested at 20,000 ppm)	ASTM D543, D412, D1434 Passed in gas permeability and weight change	
Acid Exposure (10% H2SO4 for 90 days)	ASTM D543	Less than 1% weight change
Radon Permeability	Tested by US Dept. of Energy	Zero permeability to Radon (222Rn)
Bonded Seam Strength Tests	ASTM D6392	Passed
Micro Organism Resistance (Soil Burial) average weight change, average tensile strength change, average tensile stress change, average elong-ation change, bonded seams, methane permeability	ASTM D4068-88	Passed
Methane Permeability	ASTM 1434-82	Passed
Oil Resistance Test average weight change, average tensile strength change, average tensile stress change, average elong-ation change, bonded seams, methane permeability	ASTM D543-87	Passed
Heat Aging average tensile strength change, average tensile stress change, average elongation change, bonded seams	ASTM D4068-88	Passed
Dead Load Seam Strength	City of Los Angeles	Passed
Environmental Stress-Cracking	ASTM D1693-78	Passed
PCE Diffusion Coefficient	Tested at 6,000 mg/m3	2.74 x 10-14 m2/sec
TCE Diffusion Coefficient	Tested at 20,000 mg/m3	8.04 x 10-14 m2/sec
WATERPROOFING		
Soil Burial	ASTM E154-88	Passed
Water Penetration Rate	ASTM D2434	<7.75 x 10-9 cm/sec
Water Vapor Permeability	ASTM E96	0.24 perms
Water Vapor Transmission	ASTM E96	0.10 grains/h-ft2
POTABLE WATER		
Toxicity Test	22 CCR 66696	Passed. CCR Bioassay—Flathead Minnow
Potable Water Containment	ANSI/NSF 61	NSF Certified for tanks >1,365,000 ltr
GENERAL INFORMATION		
Coefficient of Friction- geotextile both sides	ASTM D5321	0.72
Cold Bend Test	ASTM D146	Passed, no cracking at -31°C
Freeze-Thaw Resistance (100 Cycles)	ASTM A742	Meets criteria. No spalling or disbondment
Accelerated Weathering & Ultraviolet Exposure	ASTM D822	No adverse effect after 500 hours
Hydrostatic Head Resistance	ASTM D751	Tested to 42m or 60psi
Elongation	ASTM D412	1,332% - Ø reinforcement, 90% recovery
Elongation- 315gsm non-woven geotextile both sides	ASTM D751	100% (same as geotextile tested separately)
Tensile Strength	ASTM D412	58 p.s.i. without reinforcement
Tensile Strength-315gsm non-woven geotextile both sides	ASTM D751	196 p.s.i. (same as geotextile tested separately)
Tensile Bond Strength to Concrete	ASTM D413	1162 kg/m2 uplift force
Puncture Resistance-315gsm non-woven geotextile both sides	ASTM D4833	130 kg travel of probe=19mm
Flame Spread	ASTM E108	Class A with top coat (comparable to UL790)
Electric Volume Resistivity	ASTM D257	1.91 x 1010 ohms-cm

Disclaimer

The information presented herein, while not guaranteed, is to the best of our knowledge true and accurate.

While every effort has been made to provide accurate and reliable information, it is up to the user of this brochure to verify all information, including designs it might be based upon, with an independent source. Application of this data must be made on the basis of responsible professional judgement.

Except when agreed to in working conditions of use, no warranty expressed or implied is made regarding the performance of any product, since the manner of use and handling is beyond our control.