

**VERIFICATION  
OF ELOTENE  
FORMSEAL 3000X  
FORMSEAL HD AND  
FORMSEAL WWS  
SELF ADHESIVE  
WATERPROOFING  
AND TANKING  
MEMBRANE**



**FOR**  
  
**HITCHINS  
NEW ZEALAND LTD**

**PROJECT  
MANAGERS**

**ARCHITECTS**

**ENGINEERS**

**BUILDING  
CONSULTANTS**

**REGISTERED  
IQP's**



**FEBRUARY 2008**

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**VERIFICATION OF ELOTENE FORMSEAL 3000X FORMSEAL HD  
AND FORMSEAL WWS  
SELF ADHESIVE  
WATERPROOFING AND TANKING MEMBRANE  
FOR HITCHINS NEW ZEALAND LTD**

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**VERIFICATION OF ELOTENE FORMSEAL 3000X FORMSEAL HD  
AND FORMSEAL WWS SELF ADHESIVE  
WATER PROOFING AND TANKING MEMBRANE**

**1.0 INTRODUCTION**

**1.1 *Scope***

The Managing Director of Hitchins New Zealand has commissioned the Joyce Group Limited to review the Elotene Formseal 3000X, Formseal HD and Formseal WWS Self Adhesive Water Proofing and Tanking Membrane and prepare a verification report identifying how compliance with the NZ Building Code for the following clauses is achieved:

- Clause B2 Durability
- Clause E2 External Moisture

**1.2 *Elotene Formseal 3000X Formseal HD and Formseal WWS has been verified for use as a damp proof membrane system on basement walls within the following scope:***

- Within the scope limitations of NZ Building Code Acceptable Solution E2/AS1 Third Addition July 2005, section 12 and
- with dry, clean and sound substrates of reinforced concrete or concrete masonry; and
- where subsoil drainage and face draining granular back fill has been placed behind foundation basement walls; and,
- where they are not subject to hydrostatic pressure

**1.3** The product must be installed in accordance with the Hitchins' New Zealand Ltd Technical Literature referred to in Clause 2.0.

**1.4** The membrane must be installed by Hitchins' New Zealand Ltd Approved and Trained applicators.

**1.5 *Verification Report***

The report considers the data provided by Isoltema the manufacturer of Elotene Formseal 3000X, Formseal HD and Formseal WWS and by Hitchins New Zealand Ltd for Elotene Formseal 3000X, Formseal HD and Formseal WWS Self Adhesive Waterproofing and Tanking system.

Elotene Formseal 3000X, Formseal HD Formseal WWS has been marketed and supplied for installation by Hitchins New Zealand Ltd since 1998.

## 2.0 TECHNICAL SPECIFICATION

### 2.1 *Product Information*

- 2.1.1 Elotene Formseal 3000X and Formseal HD, and Formseal WWS self adhesive rubber modified-polymer bituminous membranes, protected with HDPE film.

Elotene Formseal 3000X, Formseal HD are designed to be applied to the exterior face of basement retaining walls to prevent water or water vapour penetrating to the interior face in spaces where moisture may cause damage.

Formseal HD is a heavy duty self-adhesive membrane/ used where a higher specification is required.

Formseal WWS is designed for use as a roofing underlay and a waterproofing membrane for bathrooms/ wetrooms.

- 2.1.2 The products are supplied as self adhering membranes in 1 metre x 20 metre rolls at 1.5mm thick, packed in cardboard boxes. The roll weight is approximately 30kg. There are 24 rolls in a pallet.

- 2.1.3 Primer

Hitchins' NZ Ltd Formseal penetrating solvent-based primer for new substrates. Hitchins' NZ Ltd Formseal F penetrating solvent-based primer for foam substrates.

### 2.2 *Technical Data*

#### 2.2.1 Physical and Test Data

Technical Data:	CHARACTERISTICS	VALUE	TEST
	Total Thickness	1.5 – 2.0 mm	UNI 8202
	Tensile Strength	Long.251 N/50mm Transv.271 N/50mm	ASTM 52123
	Elongation	Long.370% Transv.210%	DIN 52123
	Compound Elongation	2000%	ASTM D1000
	Adhesion to self	5.2 N/mm	ASTM D1000
	Adhesion to Primed Concrete	4.9 N/mm	ASTM D1000
	Puncture Resistance	160 mm	DIN 16726
	Tear Strength	Long.83.01N Transv.73.74N	UNI 8202/9
	Tear Strength	Long.71N Transv.88N	DIN 53363
	Cold Flexibility	< -40°C	EN 1109
	Vapour Transmission Rate	0.05 g/m <sup>2</sup> /hr	ASTM E96
	Service Temperature	-40°C/ +80°C	-

#### 2.2.2 Limitations

Elotene Formseal 3000X, Formseal HD and Formseal WWS are not suitable for foot or vehicle traffic.

### 3.0 HANDLING AND STORAGE

3.1 Handling and storage of all Elotene Formseal 3000X, Formseal HD, and Formseal WWS materials whether on/or off site is under the strict control of Hitchins New Zealand Ltd and their associated specialist applicators.

Dry storage in shaded situations between +5°C and +40°C must be provided.

Rolls of membrane must be stored on end.

### 4.0 DESIGN INFORMATION

#### 4.1 *Substrate Design*

4.1.1 Substrate design must be in accordance with the NZ Building Code (NZBC) to a relevant standard, such as NZS 3101 for concrete and NZS 4229 or NZS 4230 for concrete masonry.

#### 4.2 *Control Joints*

4.1.2 Where control or construction joints are formed in the substrate, Hitchins New Zealand Ltd must be consulted for use of the membranes over these joints.

#### 4.3 *Backfilling and Drainage*

4.3.1 The membrane must be protected against damage by the placement of a protection material between the membrane and the granular fill.

4.3.2 Backfilling, drainage and the backfill capping must be in accordance with NZBC Acceptable Solution E2/AS1 Third Edition July 2005, Section 12.

4.3.3 Backfilling must be undertaken with granular, free draining material. The top of the backfill must be capped with an impervious clay fill and may be covered with topsoil if required. The impervious capping and topsoil must slope at a minimum of 1:30 fall away from the wall.

4.3.4 A minimum 100mm diameter perforated drainage pipe must be installed at the bottom of the wall a minimum of 200mm below floor level in accordance with Figure 133 of NZBC Acceptable Solution E2/AS1 Third Edition July 2005. The pipe must be covered with a geotextile filter

fabric, be laid at a minimum 1:200 fall and discharge to a sump for the collection of deleterious material and the stormwater drainage outlet. Provision for cleaning the pipe must also be provided.

## **5.0. DURABILITY**

### **5.1 *Serviceable Life***

5.1.1 Elotene Formseal 3000X Elotene, Formseal HD and Formseal WWS are suitable DPM materials as set out in NZBC Acceptable Solution E2/AS1 Third Edition July 2005, Paragraph 12.2.2 (b), therefore they are expected to have a serviceable life of at least 50 years provided they are installed and maintained in accordance with this Verification and are continually protected from sunlight and UV radiation.

5.1.2 Isoltema Spa provides their Producer Statement for a 50 year period, supported by Hitchins New Zealand Ltd.

### **5.2 *Maintenance***

5.2.1 Annual inspections must be made to check the integrity of the membrane top edge seal and protection, the back fill capping, and the drainage pipe to ensure all are functioning as originally designed.

5.2.2 If required, the drainage pipe must be cleared to remove any sediment or silt build-up. The slope of the back fill capping must be maintained at all times.

### **5.3 *External Moisture***

5.3.1 Elotene Formseal 3000X, Formseal HD and Formseal WWS membranes, when installed in accordance with this Verification and the Technical Literature, will prevent water or water vapour from penetrating to the interior face of basement retaining walls in spaces where moisture may cause damage. The membranes have a vapour flow resistance of not less than 90 MN s/g as required by NZBC Acceptable Solution E2/AS1 Third Edition July 2005, Paragraph 12.2.1 (a).

5.3.2 The membranes self-adhere to the substrate, and can be used to form sealed joints and to seal penetrations as required by NZBC Acceptable Solution E2/AS1 Third Edition July 2005, Paragraph 12.2.1 (b). The top edge of the membrane must be sealed to the wall as set out in the Technical Literature, and protected from exposure to ultra-violet light.

5.3.3 Building designers must ensure junctions with other membranes, such as at the floor/wall junction, form a waterproof joint. Junctions have not been assessed and are outside the scope of this Verification.

## **6.0 SYSTEM INSTALLATION**

### **6.1 *Elotene Formseal 3000X***

#### **6.1.1 *Preparation***

- 6.1.1.1 The surface must be smooth, clean, dry and free from defects or irregularities which might damage the membrane.
- 6.1.1.2 Carry out any repairs to the substrate using Hitchins' Formcrete, Euromix or Form flush 665.
- 6.1.1.3 Install coves or fillets in internal corners or junctions using Hitchins' Formcrete F or Hitchins' Euromix plaster and all external corners shall be finished with a curved profile.
- 6.1.1.4 Plan installation; provide relevant working room and for the installation scaffolding as required.

#### **6.1.2 *Priming***

- 6.1.2.1 Apply Hitchins' Formseal Primer, a solvent based penetrating primer to all substrate surfaces at 8m<sup>2</sup>/L or 160m<sup>2</sup> per 20 litre pail.
- 6.1.2.2 Hitchins' Formseal Primer can be applied by brush, roller or sprayed with appropriate paint and safety gear.
- 6.1.2.3 Hitchins' Formseal F Primer is a low volatile solvent primer and is compatible to be applied over polystyrene blocks or panels.
- 6.1.2.4 Hitchins' Formseal Primer is ready to use, do not thin. Clean up with Hitchins' No. 2 Thinners.
- 6.1.2.5 Care and safety application gear is required when applying primer in closed up confined areas.
- 6.1.2.6 Prime only the area which will be covered with Hitchins' Elotene Formseal 3000X membrane that day.
- 6.1.2.7 New lightweight blocks will require two coats of Hitchins' Formseal Primer.
- 6.1.2.8 Areas not covered with membrane in 24 hours must be re-primed.
- 6.1.2.9 For best adhesion of membrane, install membrane when primer is at a tacky stage.

### 6.1.3 *Planning*

- 6.1.3.1 Before commencing installation of membrane, plan the layout of sheets, additional flashings required and application procedure.
- 6.1.3.2 Vertical surface.  
Hitchins' Elotene Formseal 3000X must be installed in vertical lengths of 2.5 to 3 metres. Therefore higher walls should be carried out in stages preferably after stage one has been back-filled.
- 6.1.3.3 Hitchins' Elotene Formseal 3000X can be installed on a vertical wall in horizontal strips. For horizontal installation, commence at the lowest point of wall.
- 6.1.3.4 Planning and cutting of membrane must allow for joint and over-lapping requirements. Side or selvage edge overlap is marked on the membrane and should be at a minimum of 60mm. End of rolls or length of membranes should be overlapped by 100mm.
- 6.1.3.5 Unroll the Hitchins' Elotene Formseal 3000X membrane and cut to the required length with a sharp knife.
- 6.1.3.6 Use a metal straight edge with a board to cut on.
- 6.1.3.7 Cut all flashing strips to the desired width and length.
- 6.1.3.8 Lay out all Hitchins' Elotene Formseal 3000X membrane length on a flat surface in sunlight to soften and ensure improved adhesion.

### 6.1.4 *Installation*

- 6.1.4.1 Unroll the Hitchins' Elotene Formseal 3000X membrane, position and align to ensure it squares horizontally or is plumb vertically so as to ensure all future lengths remain true.
- 6.1.4.2 Remove the release backing paper at the beginning of the roll (200 x 300mm) and press to primed surface.
- 6.1.4.3 Then progressively remove the remaining release backing paper and press the membrane to the surface using a hand held roller or lay off tool (vertical) or large roller for horizontal laying.
- 6.1.4.4 Remove the release paper at selvage edge to provide bitumen to bitumen seal with subsequent length of Hitchins' Elotene Formseal 3000X.
- 6.1.4.5 The next membrane strip is overlaid to the white line marked on the membrane, giving an overlap of approximately 60mm.



- 6.1.4.6 All joints should be rolled, removing any wrinkles and ensuring that the seal is good.
- 6.1.4.7 If required on a cold day, apply heat to joints, using a hot air blower.
- 6.1.4.8 If required, seal suspect joints or junction with Tixophalte or Sigilstik bitumen sealant.
- 6.1.5 ***Pre-flashes***
  - 6.1.5.1 All junctions of wall to foundations, wall to columns, upstands, pipe protrusions should have an extra strip of Hitchins' Elotene Formseal 3000X installed.
  - 6.1.5.2 All horizontal junctions should have a mortar fillet installed prior to the application of the membrane.
  - 6.1.5.3 Install Hitchins' Elotene Formseal 3000X purposely cut gusset to all internal and external corners.
  - 6.1.5.4 Foundation to first block (concrete or polystyrene) have a 200mm wide strip of Hitchins' Elotene Formseal 3000X installed, as this is a critical water penetration point.
- 6.1.6 ***Under Floor Application***
  - 6.1.6.1 Hitchins' Elotene Formseal 3000X should be installed to dry and primed site concrete slab (at least 3 days old).
  - 6.1.6.2 Alternatively, installed over Tefond (profiles facing downwards) protection membrane with Elotene Formseal 3000X joints offset to Tefond.
  - 6.1.6.3 Further alternative is to install Hitchins' Elotene Formseal 3000X over high density reinforced polythene with taped joints.
  - 6.1.6.4 With the Tefond and polythene systems, the substrate needs to be compacted including a sand layer.
  - 6.1.6.5 For other supporting substrates, check out with Hitchins' Technical Representative.
  - 6.1.6.6 Plan layout of Hitchins' Elotene Formseal 3000X and install to ensure the membrane is aligned correctly.
  - 6.1.6.7 Take off the release paper of the first 300 mm and press to the substrate. Pass the release paper under roll and pull slowly which will cause the membrane to unroll automatically.

- 6.1.6.8 Remove release paper from selvage edge, align the next roll to overlap mark and repeat the above process.
- 6.1.6.9 The Hitchins' Elotene Formseal 3000X membrane should be applied to the site concrete which has a greater area than proposed floor, i.e. outside of vertical walls.
- 6.1.6.10 Alternatively, at the circumference of the horizontal surface install Hitchins' Elotene Formseal 3000X WWS (fleecy top surface) overlapping and sealing to the Hitchins' Elotene Formseal 3000X, then installed up the face of the floor or foundation formwork. The Hitchins' Elotene Formseal 3000X WWS is loose laid to formwork (leave the backing paper on) up to formwork height.
- 6.1.6.11 Prior to placing reinforcing mesh/rods and pouring concrete, Hitchins' Elotene Formseal 3000X should be protected with Tefond, a high density profiled polyethylene (HDPE) sheet.
- 6.1.6.12 Later when formwork is stripped, Hitchins' Elotene Formseal 3000X WWS is firmly adhered to the concrete surface.  
After walls are installed, primed and Hitchins' Elotene Formseal 3000X applied, remove the release backing paper from Hitchins' Elotene Formseal 3000X WWS, bring down the Hitchins' Elotene Formseal 3000X and firmly adhere to provide an absolute seal.
- 6.1.6.13 This procedure (clauses 6.1.6.10 to 6.1.6.12) can be adopted to provide improved water proofing at critical junctions (floor foundation to walls) where the under floor damp-proofing material is HD Polythene.
- 6.1.7 ***Vertical Application***
- 6.1.7.1 Remove approximately 300mm of the release paper and position the membrane on the highest point of the surface, press well against substrate.
- 6.1.7.2 Take off the release paper and press the membrane carefully on the surface without forming wrinkles, and air-bubbles.
- 6.1.7.3 The first length should have been plumbed or leveled to ensure it was true. Subsequent lengths will also be true and reduce waste.
- 6.1.7.4 Before installing the next length, take off the overlapping release paper at selvage edge and apply the second membrane following the white indication line on the first membrane for the right overlapping size, then unroll the membrane further by taking off the release paper of the roll and adhere to the substrate.
- 6.1.7.5 Take care to ensure that no wrinkles or air bubbles are formed by pressing (ironing) membrane with a block or roller.

- 6.1.7.6 Take special care to ensure overlap is free of wrinkles. Roll with roller.
- 6.1.7.7 On cold days, the overlap may require softening with hot air torch.
- 6.1.7.8 Terminate the top of the membrane with tooled off Tixophalte or Sigilstik sealant bead.
- 6.1.7.9 All pipe protrusions to receive an additional layer of Hitchins' Elotene Formseal 3000X and sealed with Tixophalte or Sigilstik sealant.
- 6.1.7.10 Install Tefond protection sheet prior to backfilling.

## 6.2 *Elotene Formseal HD*

### 6.2.1 Horizontal Application

- 6.2.1.1 Hitchins' Elotene Formseal HD is for decks, balconies, roofs, which will be subsequent buried (garden), tiled or paved over or finished with gravel or coloured aggregates.
- 6.2.1.2 Hitchins' Elotene Formseal HD can be installed on carpark concrete substrates to provide a waterproof membrane and then overlaid with a double layer asphalt.
- 6.2.1.3 Installation must be absolutely thorough to ensure no problem areas in the future.
- 6.2.1.4 The installation must start from the lowest point and the joints must be formed to shed water.
- 6.2.1.5 Take off the release paper for 300mm to 1 metre and apply on the surface. Pass the release paper under the roll. Pulling the release paper slowly will cause the membrane to unroll automatically without forming wrinkles.
- 6.2.1.6 Remove the release paper at selvage edge before installing new length.
- 6.2.1.7 Install the second membrane strip, following the white indication lines on the edges of the membrane. Take off the release paper off the backside at the overlapping at the same time during unrolling the membrane.
- 6.2.1.8 Laying of Hitchins' Elotene Formseal HD membrane is improved if a large roller is used to remove wrinkles.
- 6.2.1.9 Upstands and junctions should have pre-installed double up flashing of Hitchins' Elotene Formseal HD.
- 6.2.1.10 Take special care with overlay joints, pressing down with a roller to ensure wrinkle free joint.

- 6.2.1.11 All protrusions double flushed and sealed with Tixophalte or Sigilstik bitumen sealant. All suspect joints should also be sealed.
- 6.2.1.12 Wall junction should be over flushed with Hitchins' Formseal HD with over lap down onto a horizontal surface of 100mm.
- 6.2.1.13 Roof gardens shall receive a base layer of Hitchins' Elotene Formseal 3000X, followed by a top layer of Hitchins' Elotene Formseal HD. The top layer joints offset from base layer.
- 6.2.1.14 Roof garden procedure is Tefond protection, layer of gravel Geotextile cloth, dirt layer and then planting. Acquire Hitchins' publication on roof gardens covering the complete system.
- 6.2.1.15 After the application of Hitchins' Elotene Formseal HD, protect the membrane from direct sunlight by Hitchins' Tefond, tiling over, concrete, gravel or pavers.
- 6.2.1.16 Tiling over should be over a reinforced concrete screed at a minimum thickness of 30mm, incorporating ample construction joints at perimeter and through screed which will subsequently be treated with sealant.
- 6.2.1.17 Paving over Hitchins' Elotene Formseal HD membrane by first installing Tefond with profile pointing upwards. This provides support at 25mm centres and excellent drainage. Alternatively, sit the pavers on Hitchins' Helastorings.
- 6.2.1.18 Gravel finish would also require Tefond membrane protection and provide good drainage.

## 6.2.2 *Openings*

- 6.2.2.1 With openings, for example: waterstops, apply a layer over the opening, cut it in all directions and seal the edges inside the opening.
- 6.2.2.2 Apply the membrane over the opening and cut it as described before. A double layer will ensure the integrity of the waterproofing. Edges can be sealed with Tixophalte or Sigilstik bitumen mastic.
- 6.2.2.3 Overflow pipes should also have double membrane flashing, taken up and turned down into pipe.
- 6.2.2.4 All protrusions, pipes, skylight are to be double flashed with Hitchins' Elotene Formseal HD.

## 6.3 *Elotene Formseal WWS*

### 6.3.1 Application

- 6.3.1.1 Hitchins' Elotene Formseal WWS is an anti-slip layer for under roof tiles and as a water proofing membrane for bathrooms/ wetrooms.
- 6.3.1.2 Hitchins' Elotene Formseal WWS can be installed on timber or concrete surfaces.
- 6.3.1.3 All surfaces must be cleaned and dry, smooth and free from irregularities. Damaged or dirty surfaces must be cleaned and repaired.
- 6.3.1.4 On porous or uneven surfaces one coat of bituminous primer of 250gr/sqm is recommended.
- 6.3.1.5 The product must be unrolled in a perpendicular direction to the slope. Application shall commence from the lowest point upwards making sure not to overlap in the opposite direction. Side laps must be a minimum of 80 to 100mm and at least 150mm of end laps. Sheets are to be applied to prevent creasing and entrapment of air bubbles. Particular care must be taken with laps, corners and joints.
- 6.3.1.6 Following application the membrane shall be protected from site traffic damage or accidental perforation.

#### 6.4 *Accessory Products*

##### 6.4.1 Metal Flashings

- 6.4.1.1 Where metal flashings are required to be sealed, they can be adhered to the membrane and sealed using double sided Formseal Knotabit (contact) supplied by Hitchins.
- 6.4.1.2 This applies to wooden battens or any other type of flashings or mouldings.
- 6.4.1.3 Finally, these too if required can be sealed off with Tixophalte or Sigilstik.

##### 6.4.2 *Expansion Joints and Chases*

- 6.4.2.1 There are a number of ways to treat these as covered under subsequent detailed drawings in Appendices.
- 6.4.2.2 Hitchins' Elotene Formseal 3000X, Hitchins' Elotene Formseal HD and Elotene Formseal WWS can be turned into a chase or expansion joint then sealed off with Tixophalte or Sigilstik or Superflex, a high quality sealant.
- 6.4.2.3 Hitchins' Elotene Formseal 3000X, Hitchins' Formseal HD Hitchins' Formseal WWS can also be overlaid at this junction to provide a further waterproof seal.

#### 6.4.3 *Protection*

In tanking situations, i.e below-ground waterproofing or walls treated where the structure is built into a bank, Hitchins' Elotene Formseal 3000X, and Hitchins' Elotene Formseal HD need to be protected against back-filling.

Hitchins' Tefond is an excellent protection membrane and provides improved drainage. Available in 20x2 metre wide rolls, Tefond is a high density profiled polyethylene membrane that interlocks at edges. Easy to install, fixed at the top of the wall only. Dataspec and written installation procedure or instructions are available.

Tefond Plus incorporates two beads of sealants that in 24 hours will provide an absolute seal. This then provides an additional waterproofing membrane that is ideal in high water level areas.

Hitchins' Elotene Formseal 3000X, Hitchins' Elotene Formseal HD and Hitchins' Elotene Formseal WWS can be protected by other approved protection boards.

### 7.0 **HEALTH AND SAFETY**

7.1 The product is non-hazardous when use in the correct manner and by qualified adults.

7.2 Possible handling risks: cuts and abrasions; keep out of the reach of children.

### 8.0 **BASIS OF VERIFICATION**

The following is a summary of technical investigations carried out:

#### 8.1 *Tests*

8.1.1 The following testing of Elotene Formseal 3000X, Elotene Formseal HD and Elotene Formseal WWS has been undertaken by the following organization.-

**Istituto Giordano S.p.A, Italy –**

Thickness, dimensional stability, tensile properties, tensile strength at joints, puncture resistance, water absorption, pliability test, water vapour transmission hydrostatic test, resistance to leakage at joints and determination of resistance to tearing.

### 8.1.2 *Quality*

- 8.1.2.1 The quality management system of the membrane manufacturer, Isoltema S.p.A, Italy was assessed and accredited and confirmed in November 2003 as meeting the requirements of UNI EN ISO 9001: 2000 by SINCERT, Milan, Italy, Accreditation Number 16.
- 8.1.2.2 The quality of materials supplied is the responsibility of Isotema's Agent.
- 8.1.2.3 The quality of storage and installation on site is the responsibility of Hitchins' New Zealand Ltd approved applicator.
- 8.1.2.4 Designers are responsible for the building design, and building contractors are responsible for the quality of construction and substrate systems in accordance with the designer's specifications and guidance of Hitchins New Zealand Ltd.
- 8.1.2.5 Building owners are responsible for the maintenance of the Elotene Formseal 3000X, Elotene Formseal HD and Elotene Formseal WWS in accordance with the instructions of Hitchins New Zealand Ltd.

## 9.0 **BUILDING REGULATIONS**

- 9.1 In the opinion of the Joyce Group Ltd, Elotene Formseal 3000X, Elotene Formseal HD and Elotene Formseal WWS, if used installed and maintained in accordance with the statements and conditions of this verification, will meet or contribute the following provisions of the NZ Building Code.

*Clause B2 Durability:* Performance B2.3.1 (a) not less than 50 years. Elotene Formseal 3000X, Elotene Formseal HD and Elotene Formseal WWS meet this requirement. See Paragraph 5.1.

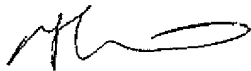
*Clause E2 External Moisture:* Performance E2.3.3. Elotene Formseal 3000X, Elotene Formseal HD and Elotene Formseal WWS meet this requirement. See Paragraphs 5.3.1 to 5.3.3.

*Clause F2 Hazardous Building Materials:* Performance F2.3.1. Elotene Formseal 3000X, Elotene Formseal HD and Elotene Formseal WWS meet this requirement and will not present a health hazard to people. See Paragraph 7.0.

- 9.2 This verification appraises Hitchins' Formseal 3000X, Hitchins' Elotene Formseal HD and Hitchins' Elotene WWS as an Acceptable Solution in terms of New Zealand Building Code Compliance. The membranes comply with NZBC Acceptable Solution E2/AS1 Third Edition July 2005, Paragraph 12.2.1 (a), (b) and (c), and Paragraph 12.2.2 (b).

***Sources of Information***

- Compliance Document for New Zealand Building Code External Moisture Clause E2, Department of Building and Housing, Third Edition July 2005.
- New Zealand Building Code Handbook and Approved Documents, Building Industry Authority, 1992.
- The Building Regulations 1992, up to, and including October 2004 Amendment.



R F Thurlow  
**JOYCE GROUP LIMITED**



**APPENDIX 1**  
**Hitchins' New Zealand Ltd**  
**Producer Statement**



P.O. Box 42-748, Brixton Hill, Wellington, New Zealand

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## PRODUCER'S STATEMENT On

### FORMASEAL 3000X & TEFOND PROCESS

HITCHINS NEW ZEALAND LIMITED is the marketer of a range of products including Formaseal 3000X Tanking Membrane and Tefond protection sheet.

All products are produced to a high standard and subject to strict Quality Control procedures. The Formaseal 3000X Tanking Membrane and Tefond are installed by an approved licensed Gunas applicators in keeping with Product Technical Datasheet and comprehensive written Application Procedure instructions.

#### Formaseal 3000X

Supplier of Italy confirms a durability of 50 years for its Elastene 3000X product. This product is supplied to Hitchins New Zealand Limited and marketed in New Zealand and the Pacific Islands under their brand name Formaseal 3000X.

This products durability period of 50 years is that it will perform as required when applied over a prepared surface that has been sealed with Formaseal Primer, protected when backfilling and remain buried or protected from UV Rays.

#### Tefond

The Tefond range of products is manufactured by Tefon S.r.l. of Italy under strict quality control to high production standards and carries a Durability Statement for a 50 year period. Buried it will not deteriorate and will perform as required.

Tefond is a high density extruded polyethylene membrane with raised 8mm stud profiles with side interlocking notches at roll edges. It is supplied in rolls of 20 metres long by 2.07 width. Overlapping and engaging the interlocking notches of subsequent sheets produces a continuous membrane.

#### Warranty

Hitchins New Zealand Limited will provide a Product Performance Warranty for these products for a period as required under the Construction Act.

For and on behalf of:

HITCHINS NEW ZEALAND LIMITED

Jim Gerbes  
MANAGING DIRECTOR

Dated: 13 January 2006

C:\Users\Jim\Documents\Producer's Statement Form.mxd

**APPENDIX 2**  
**Elotene Formseal**  
**Installation Details**

## EloTene Waterproofing

Self adhesive bitumen membranes protected by films or synthetic materials

### WHAT IS ELOTENE WATERPROOFING?

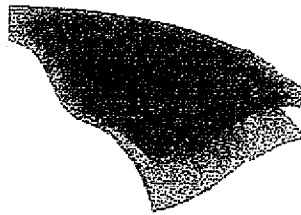
EloTene waterproofing is a bituminous self adhesive membrane range for civil and industrial uses.

A bituminous self adhesive membrane made of special bitumens modified with synthetic rubbers and high tack resins, is coated on films or synthetic materials, creating self adhesive, sound-deadening and vapour barrier products.

They can be widely used in the general building sector in traditional industrial application or in high tech ones.

These membranes are extremely elastic and adaptable, thanks to the high tech level of its films or materials, they can stand very high mechanical elongation and stress not comparable with any other waterproofing material.

EloTene Waterproofing membranes adhere on most building and industry materials, granting an easy and safe application and at the same time a shorter laying time.



## PRODUCT RANGE

EloTene Waterproofing range consists of the following membranes:

### Self adhesive membranes without reinforcement

- ELOTENE 3000X      protected by an HDPE cross laminated film
- ELOTENE 1000      protected by a LDPE filmprotected by a LDPE film

### Self adhesive membranes with reinforcement

- ELOTENE FG 50      protected by a polyethylene film and reinforced with a 50gr/sqm glass fibre.
- ELOTENE TNT 150      protected by a polyethylene film and reinforced with a 150gr/sqm polyester material.

### Self adhesive system membranes

- ELOTENE HD      Heavy Duty Membrane
- ELOTENE DS      Vapour barrier membrane
- ELOTENE RV 77      sandwich system/heavy duty membrane
- ELOTENE VWS      underlayer membrane
- ELOTENE KONTABIT R.      double sided adhesive membrane

These "Ad Hoc Line" membranes have been conceived as a solution for specific problems.

## WHY ELOTENE WATERPROOFING?

EloTene Waterproofing membranes being industrially pre-casted and pre-coated, are very easy and fast to be installed.

- they are cold applied, with no use of flame; for this reason they can be used on heat sensitive surfaces, isolating panels and surfaces where the use of the open flame would be dangerous.
- EloTene Waterproofing being self adhesive does not need any glue or supplementary adhesive; to obtain a good result the applicator needs few tools and some basic application knowledge.



## WHY CHOOSING ELOTENE WATERPROOFING

- it is protected by high tech materials and films!!!!

The films or synthetic fabrics of EloTene Waterproofing have high tech content, granting the membrane good elongation performances and they fit easily to non regular surfaces.

- they are chemical agents resistant.

The protection of the EloTene waterproofing membranes are resistant to most of chemical agents, keeping the membrane unaffected from acids, bases, detergents and polluters in general.

- one layer system is sufficient

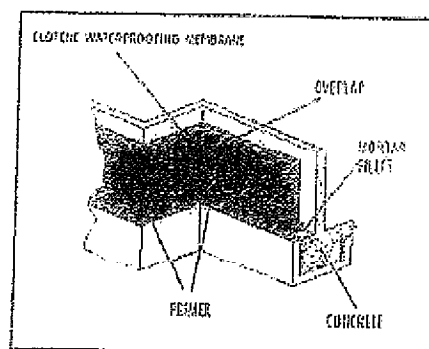
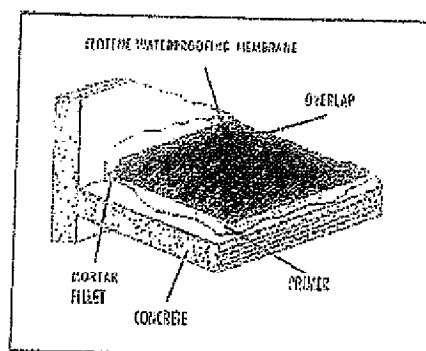
Thanks to its excellent elongation and strength performances, EloTene membranes are enough to be applied as a one layer system in waterproofing applications in concrete structures, foundations and civil works. If well supported, the EloTene membranes resist to high hydrostatic pressures.

- self sealing

When damaged by little cuts, the membrane compound will self seal retaining its waterproofing characteristics.

- easy application on vertical and horizontal surfaces

The extreme easiness and lightness of self adhesive membranes offer fast applications on vertical and horizontal surfaces and corner details.



### GENERAL PRECAUTIONS

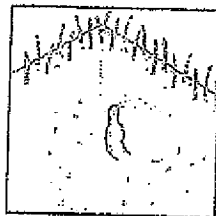
In general, Elofene membranes do adhere on all dry, clean, sealant-oil-solvent free surfaces at an ambience and surface temperature of  $+5^{\circ}\text{C}$ .

However it is possible to apply Elofene waterproofing membranes also at temperatures lower than  $5^{\circ}\text{C}$ .

In this case it is requested to heat up the surface and membrane compound with hot air. The surface has to be prepared to obtain the best results:

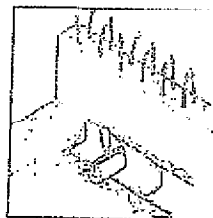
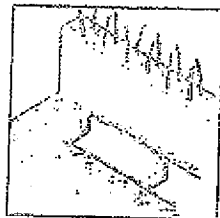
- the surface must be clean and dry; use a (metal) brush to remove dirt, mould and other traces and as final remove the dust. Important is that the concrete surface is completely finished and dry i.e. after 30 days from casting

- the surface must be compact. If the substrate is porous it is necessary to treat the surface with a bituminous primer (200/400 gr/sqm depending on the porosity of the surface) which is liquid and fast drying. The primer must be of a good quality brand with the earlier mentioned characteristics to obtain the best results.



- Surfaces with or without primer should be dry and finished. Take care of the dew forming at low temperatures early in the morning. The installation on moist, wet or solvent traced surfaces will cause the detaching of the membrane.

- special care when installing the membrane in angles or corners; press well with a roller or a cloth to prevent leakages.



Elofene Waterproofing membranes are not resistant to UV rays, therefore it is necessary to protect the membrane surface within 15/30 days after application. Like this the polyethylene film remains undamaged and unaffected. Moreover Elofene membranes are not intended to withstand everyday vehicle or foot traffic; be careful during maintenance works.

- storage:

It is important to keep Elofene membranes in its original packing at a temperature between  $+3^{\circ}\text{C}$  /  $+40^{\circ}\text{C}$ . Elofene will retain its characteristics in time; our experience and laboratory tests confirmed good adhesion after 3/5 years.

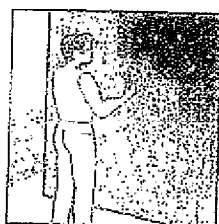
### APPLICATION PROCEDURE

Prepare the surface in order to get the best results. The surface should be smooth, clean and free from irregularities and defects that may damage the membrane.



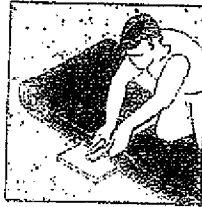
Use a wire brush or broom to remove the dirt, dust, mould or any residues which might damage the membrane; blow the surface to remove any dusts.

In case of porous surfaces, we recommend to condition the surface with one coat or more of a fast drying liquid bituminous primer (200/400gr/sqm); a good quality primer will assure fast drying, good adhesion performance of the membrane and a good surface support.



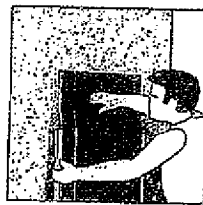
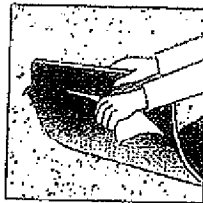


Apply the membrane when the surface is completely finished.  
Unroll the membrane on the conditioned surface by facing the adhesive part to the surface and proceed by removing the release film, in order to let the membrane automatically laying without wrinkles or folds.

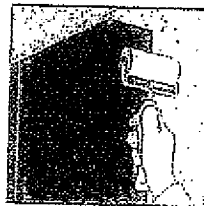
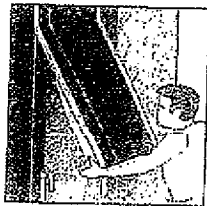


### VERTICAL APPLICATION

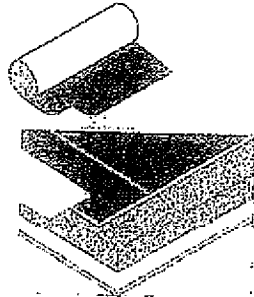
Remove approximately 30cm of the release film and position the membrane on the highest point of the surface to waterproof, then press well.



Take off the remaining release film from the highest to the lower part and press well on the surface in order to avoid the forming of air bubbles and wrinkles.



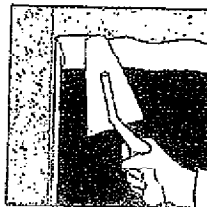
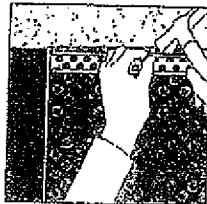
The membranes should be applied in 2m/2.5m high section; in case the surface is higher, two or more laying phases are requested. Taking care of the side and end overlapping.



On the side edges of the membrane there are two white marking lines indicating the ideal overlapping at 5/6cm.



Terminate the top of the membrane with a mechanical fixing or with a mastic; this will avoid the detachment of the membrane due to leakages.

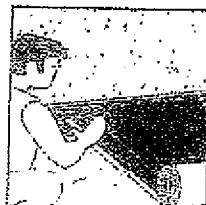
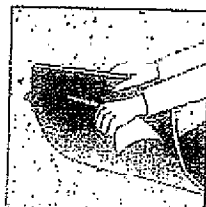


Before backfilling, protect the membrane with the appropriate mechanical protection layer.

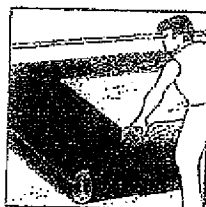


**HORIZONTAL APPLICATION**

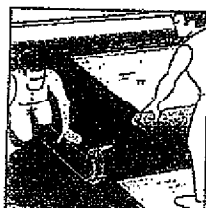
The installation should start from the lowest point following the longitudinal or transversal direction. Unroll the membrane and take off about 1 m of release film. Apply the membrane on the surface.



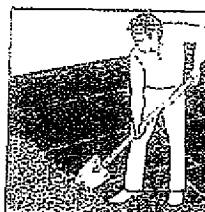
Roll up the membrane again, in order to pass the release paper under the roll. Like this, by pushing the siliconized release film the membrane will automatically unroll itself. The waterproofed surface will be smooth and without wrinkles.



During installation the membrane might leave the ideal lining, therefore take special care of the positioning of the membrane in order to avoid wrong applications.



After the out door application, protect the membrane from U.V. rays within 1 month. Anyway the membrane has not to be exposed to the sun; it has to be protected by a protection board.



### ELOTENE WATERPROOFING: THICKNESSES, PRODUCT RANGE, MEASURES.

The standard thickness of EloTene Waterproofing membranes is 1.5mm, 1mt x 20mt roll.

On customer request special sizes are available.

### ELOTENE 3000X

EloTene 3000X consists of a self adhesive compound protected by a high density polyethylene film (HDPE) which grants protection and mechanical features.

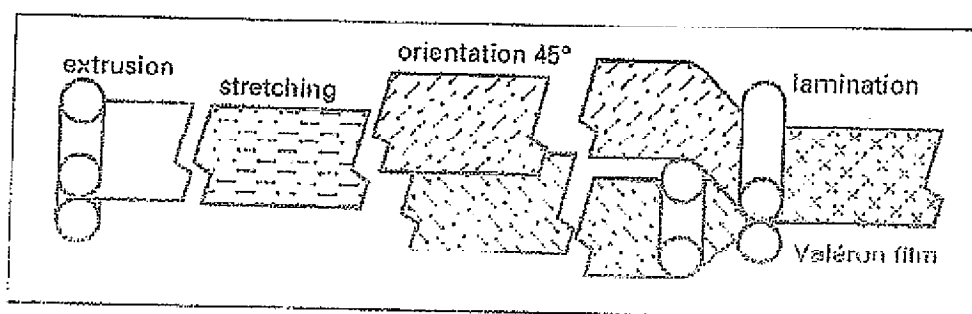
The polyethylene film is cross laminated; this means that two films have the molecule orientation running at an angle of 90°C.

This film possesses the same mechanical characteristics both transversal as longitudinal; the film owns 500% elongation both in longitudinal as transversal direction.

Moreover it is high pressure and chemical agents resistant.

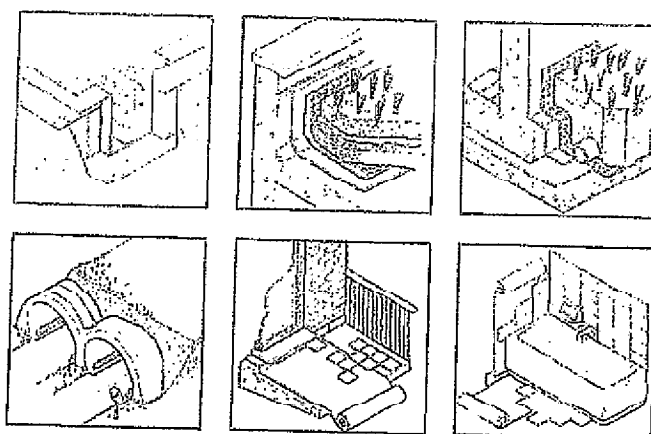
This PE film is non-toxic i.e. can be in contact with food and potable water.

The combination of the PE film and the bituminous self adhesive compound makes the product extremely adaptable for applications in silos, waterbasins/tanks and general building structures.



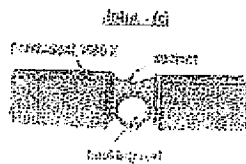
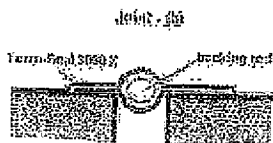
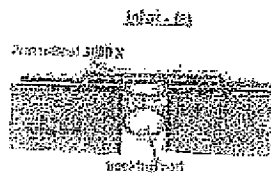
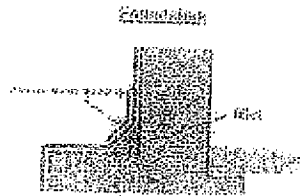
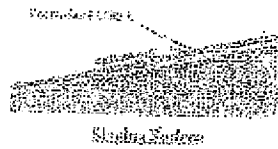
## USES

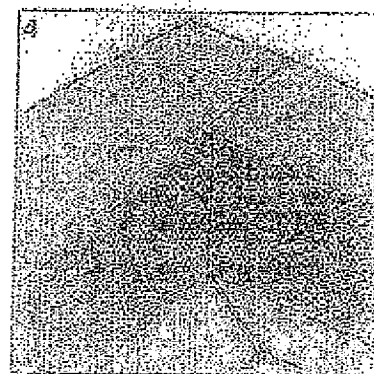
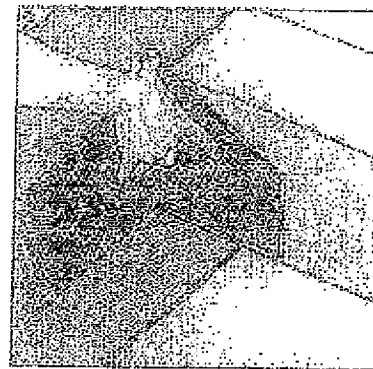
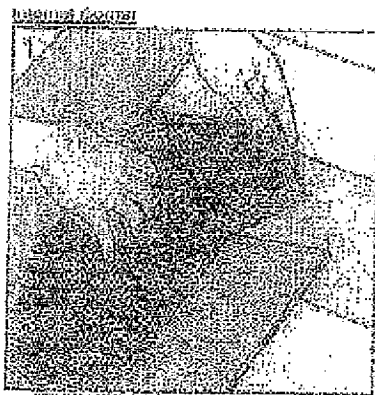
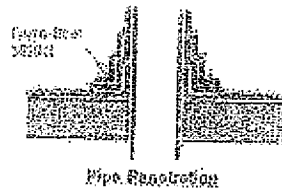
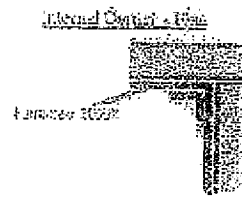
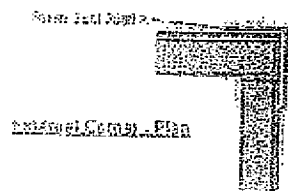
The peculiar Etotena 3000X characteristics determine its versatility of uses. It is ideal to waterproof concrete structures, wood surfaces or masonry. It is used to waterproof below grade structures such as foundation walls, tunnels, underground parkings, surfaces such as terraces, balconies, greenhouses, bathrooms, kitchens and laboratories.





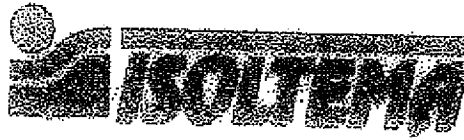
The following drawings may assist you with installation of Hixhins' Formaset 3000X, Hixhins' Formaset HD and obtain the right finish at various points. For further information, contact Hixhins' Offices or Technical consultants





**APPENDIX 3**  
**Producer Manufacturer**  
**Isoltema Supply Statement**





ISOLTEMA SPA - VIA G. PERTICARI 6/8 - 47026 GAMBETTOLA (FC) ITALY

TEL. +39-0547-54240 FAX +39-0547-54242 - Internet: [www.isoltema.com](http://www.isoltema.com)

TO WHOM IT MAY CONCERN

Dear Sirs,

We, Isoltema S.p.A. Italy, confirm that the company Hichins NZ is buying our Flotene self adhesive waterproofing membranes under a private label FORMSEAL since 1998. Isoltema offers technical details on request [isoltema@isoltema.com](mailto:isoltema@isoltema.com). We hope to have you informed properly.

Yours faithfully,

ISOLTEMA S.p.A.  
A handwritten signature in dark ink, appearing to be "G. Perticari", written over the printed name "ISOLTEMA S.p.A.".

Dated: 22 May 2006

**APPENDIX 4**  
**Producer Manufacturer**  
**Isotema Durability Statement**



ISOLYEMA SPA - VIA G. FERTONARI 4/5 - 47035 SANSEVERINO (FC) ITALY

TEL. ++39-0547-54240 FAX ++39-0547-54242 - Internet: [www.isolyema.com](http://www.isolyema.com)

Comments:

### TO WHOM IT MAY CONCERN

## Durability Statement

On request of our customers Hitech New Zealand Limited, we confirm a durability of 50 years for our Eternal 3000X product. This product is supplied to Hitech New Zealand Limited and marketed in New Zealand and the Pacific Islands under their brand name Formisal 3000X.

This product's durability period of 50 years is that it will perform as required when application is done exactly following the instructions mentioned in our product literature over prepared surfaces that have been coated with Formisal Primer, protected when back-lining and remain buried or protected from UV Rays.

Warranties for specific projects issued by Hitech New Zealand Limited in keeping with this Producer's Statement and register kept.

Hoping to have informed you properly

Yours sincerely,

ISOLYEMA SPA

**APPENDIX 5**  
**UNI EN ISO 9001:2000 Management**  
**System Certificate**  
**Issued to**  
**ISOLTEMA S.P.A The Product Manufacturer**



**ISTITUTO GIORDANO S.p.A.**

Via Rosalia, 2 - 47014 Bellaria Igea Marina (RN) - Italy

# MANAGEMENT SYSTEM CERTIFICATE

Certificato n° 101

PIÙ INSIEME  
PIÙ IN SICUREZZA

ISTITUTO INTERNAZIONALE DELLA QUALITÀ  
INTERNATIONAL INSTITUTE FOR QUALITY

**ISOLITTELLA S.p.A.**

Via Saffi, 10 - 47025 CARPI (PR) - Italia

UNITÀ OPERATIVA

OPERATIVE UNIT

PIÙ INSIEME  
PIÙ IN SICUREZZA

CONFORME AL REQUISITO DELLA NORMA  
COMPLYING WITH THE STANDARD  
ENR 121830 2001:2000 (ISO 9001:2000)

Questa certificazione è valida per le seguenti applicazioni:

THIS CERTIFICATE IS VALID FOR THE FOLLOWING APPLICATIONS:

Progettazione e produzione di nastri e moduli per macchine a microprocessori,  
integrazione per film sottili e digitali  
Design and manufacture of self-adhesive tape and tapes  
Production of film or gradient materials

SETTORE DI ACCREDITAMENTO: 16

Luogo e data di emissione

Place and date of issue

Bellaria Igea Marina, 21/11/2005



Luogo e data di presa in possesso

Place and date of possession

Bellaria Igea Marina, 21/11/2005

Modello 101

Il presente certificato è valido per le seguenti applicazioni:  
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