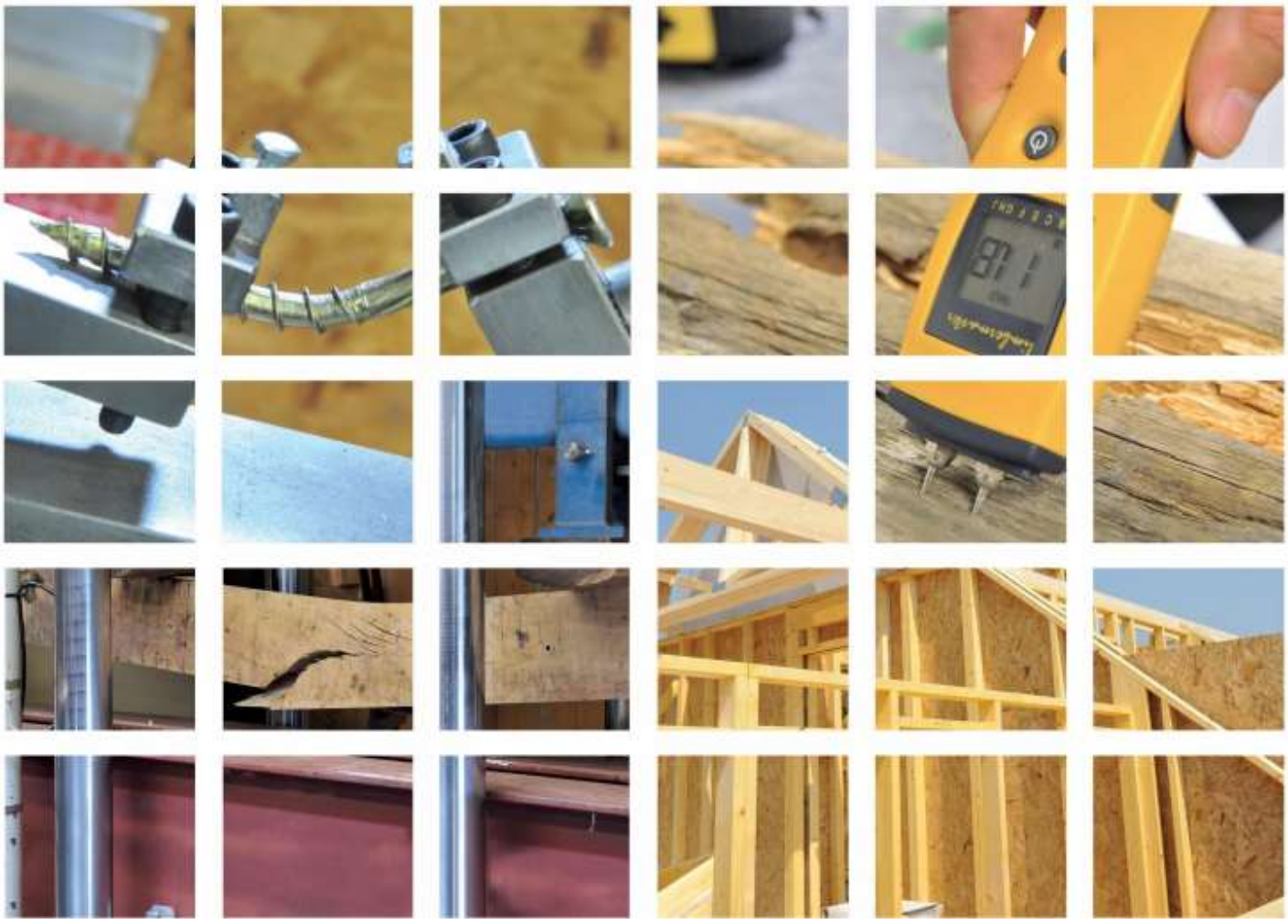
Q-Mark Registration Schedule

Vapour Impermeable (Type HR) Roof Underlay

Protect Wunderlay

Protect Membranes
2 Brooklands Road
Sale
Cheshire
M33 3SS



Q-Mark Registration Schedule

Holder of Q-Mark		Protect Membranes
Product Name		Protect Wunderlay
Type and Use of Product		Vapour Impermeable (Type HR) Roof Underlay
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1 INTRODUCTION

The Q-Mark Scheme is a third-party product certification scheme operated by BM TRADA Certification Ltd.

The scheme is based on the principles of ISO 9001, ISO 17065, ISO 17021 and confirms compliance with BS EN 5250 and BS EN 5534, together with a specific set of performance criteria set by BM TRADA (as defined in Clause 4 of this document) in order to attain a product which performs to a high standard. The relevant standards listed above are to be read in conjunction with this document.

The scheme covers factory production control, documentation and test/assessment evidence, and the resultant certification is specific to clearly defined products and their constituent components.

The objectives of the scheme are:

- To improve the quality and performance of Construction Products.
- To provide unambiguous evidence of compliance with the standards or methods listed.
- To provide specifiers, regulators and inspection authorities with the appropriate information for them to identify suitable products.

2 DEFINITIONS & ABBREVIATIONS

The following definitions and abbreviations are used throughout the document. Other definitions are as given in the relevant standards.

Assessment	A considered judgement to consider whether products meet the criteria laid down in the relevant Technical Specification
Audit	Visit by BM TRADA or other certification body to examine the quality management system and production processes of a manufacturer or supplier, usually to determine appropriate compliance to ISO 9001, with specific emphasis on the factory production control elements
Member	Company holding membership of the Q-Mark scheme
QMS	Quality Management System (e.g. one meeting BS EN ISO 9001)
Schedule	The certification schedule, which identifies the scope and range of products covered by the membership certificate
Scheme	The BM TRADA Q-Mark Construction Products Scheme

3 SCOPE

The Scheme is applicable to construction products which fall within the scopes of the product standards referenced in clause 1 of this document, and applies to products as manufactured and supplied, and before being installed into the works.

4 PRODUCT DESCRIPTION

Protect Wunderlay is an impermeable polymeric roof underlay comprising of a polypropylene non-woven layer, coated on one surface with a continuous film of polyethylene / polypropylene blend. It is black in colour on the lower surface and on the upper (coated) surface.

Protect Wunderlay will provide a satisfactory underlay in tiled and slated pitched roofs constructed in accordance with BS 5534: Part 1. It is flexible at low temperatures and resistant to tearing by nails and from handling on site.

4.1.1 Table 1: Nominal Characteristics

Property	Protect Wunderlay
Thickness (mm)	0.49
Mass/unit area (g/m^2)	120
Roll length (m)	15; 30; 45
Roll width (m)	1.0 ; 1.5

4.2 Intended Use

- Under the scope of this certification, Protect Wunderlay has been approved for use as a Type HR polymeric roof underlay, in pitched roof construction under slates or tiles as a secondary weather resistant layer for protection against wind driven rain and snow, tile wind-uplift and dust ingress.
- The product may be installed in new or existing buildings. In all cases it shall be ensured that the timber roof supporting structure is adequately secured to the building and capable of withstanding the maximum expected wind uplift forces (includes existing roofs previously tiled without an underlay).

5 BUILDING REGULATIONS

Protect Wunderlay is certified under the BM TRADA Q-Mark Construction Products Scheme. It is the opinion of BM TRADA that if used in accordance with the requirements of this scheme and in accordance with the installation manual, then the product will satisfy, or contribute to satisfying the relevant requirements of the following Regulations:

- The Building Regulations 2000 (England and Wales)
- The Building (Scotland) Amendment Regulations 2010
- The Building Regulations (Northern Ireland) 2000
- The Building Regulations (Ireland) 1997

6 SCHEME REQUIREMENTS

BM TRADA has determined that the Member conforms with the requirements within these clauses by auditing and/or other forms of verification where appropriate.

6.1 Quality Management System (QMS)

The manufacture of the products has been conducted under the control of an appropriate QMS.

The QMS shall be subject to periodic audit (not less than once per year).

All new Members are subject to an initial inspection.

6.2 Documentation

The following documents are controlled under the requirements of this scheme:

- Manufacturing documentation (e.g. Quality Manual, procedures)
- Product specification/range documentation and assessment
- Installation instructions
- Test reports and sampling
- Q-Mark certificate and schedule(s)

6.2.1 Manufacturing Documentation

The Member has supplied details of his manufacturing documentation to BM TRADA for review. This comprised of the Quality Plans, Procedures, Works Instructions and Test Data.

7 MINIMUM QMS REQUIREMENTS

7.1 Factory Production Control

As part of the documented process control procedures the company has:

- Demonstrated that the products are being fabricated in accordance with documented manufacturing procedures from purchase of raw material to the production of the finished product.
- These procedures control all critical aspects of the production.
- Target limits are defined at each one of these areas.
- All performance characteristics claimed are controlled in order to remain consistent by including appropriate checks or testing in the QMS to ensure a consistent and similar product is produced.

7.2 Management Responsibility

The management of the company carries out regular reviews of the system, which shall include production records and any complaints that have been received. Notes are kept of any topics discussed and decisions made.

7.3 Company Representative

A member of the management team is responsible for the QMS.

7.4 Internal Audits

Routine internal audits are carried out to ensure compliance with the requirements of the scheme is met.

7.5 Documentation

Inspection and test records are kept in a format that is acceptable to BM TRADA Certification for a minimum of 5 years.

7.6 Work Instructions

Work instructions and target values are placed at the critical production points throughout the manufacturing process.

7.7 Procedures for Non-conforming Product

Where factory production control/target values are out of specification there is a procedure for identifying and correcting these deficiencies. The factory production control system has been assessed and found to be able to detect non-conforming product quickly enough so that affected product can be quarantined.

7.8 Traceability

There are procedures, which enable appropriate traceability of production runs through to dispatch.

7.9 Training

The company maintains records to show that staff has been satisfactorily trained to undertake the manufacturing and inspection tasks that they have been assigned. Records are kept of this training and the personnel's job description shall be clearly defined.

7.10 Complaints

The company maintains a register of all complaints received on the quality of their product, which shows the steps they have taken to deal with the problem and their analysis of the causes. These records are kept for a minimum of 5 years.

7.11 Document Control

There are procedures in place for effectively controlling the quality of documentation issued to the relevant personnel, so that they have up-to-date procedures.

7.12 Machinery Maintenance and Calibration

All machinery and measuring / testing equipment that could affect the quality of the product is properly maintained and calibrated so that a consistent product can be produced and tested. There is a maintenance and calibration schedule. A record is kept of the maintenance and calibration carried out.

8 OTHER REQUIREMENTS OF THE SCHEME

8.1 Product Specification/Range Documentation and Assessment

The member has supplied BM TRADA with product details for review. These included material specifications, dimensions, tolerances and components. This product specification forms part of the manufacturing procedure.

Should the product specification of the certified product/s change, the member shall inform BM TRADA of the changes. A decision on the way forward shall be made to ensure continuation of certification.

9 TRANSPORT STORAGE AND INSTALLATION INSTRUCTIONS

9.1 General

The member shall ensure that adequate installation, storage and transport instructions are supplied with each pack or consignment of product. Any alterations to the instructions shall only be made following consultation with BM TRADA.

9.2 Identification

The products shall be supplied in rolls wrapped in polyethylene on pallets. Each roll shall bear a label indicating the manufacturers name, the product name, nominal dimensions and the BM TRADA Q-Mark logo and Certificate Number. Installation instructions shall also be supplied with each roll/consignment.

9.3 Storage and Handling

- Rolls shall be securely stacked on site, on a level surface, preferably under cover. Rolls shall not be allowed to rest against sharp projections.
- Protect Wunderlay stacked in the open must be protected from accidental damage, and unwrapped material shall not be left exposed to prolonged UV light.

- Reasonable precautions shall be taken in handling the rolls to prevent damage such as tears or perforations occurring before and during installation, and prior to the application of the roof covering.

9.4 Installation

9.4.1 General

Installation and fixing of Protect Wunderlay shall be in accordance with BS 5534, BS 8000: Part 6 and the requirements of this certificate. In all cases of use, the loft space shall be ventilated following the recommendations of BS 5250.

Protect Wunderlay shall not be laid in direct contact with any wet timber preservative, either water or solvent based.

9.4.2 Specific Installation

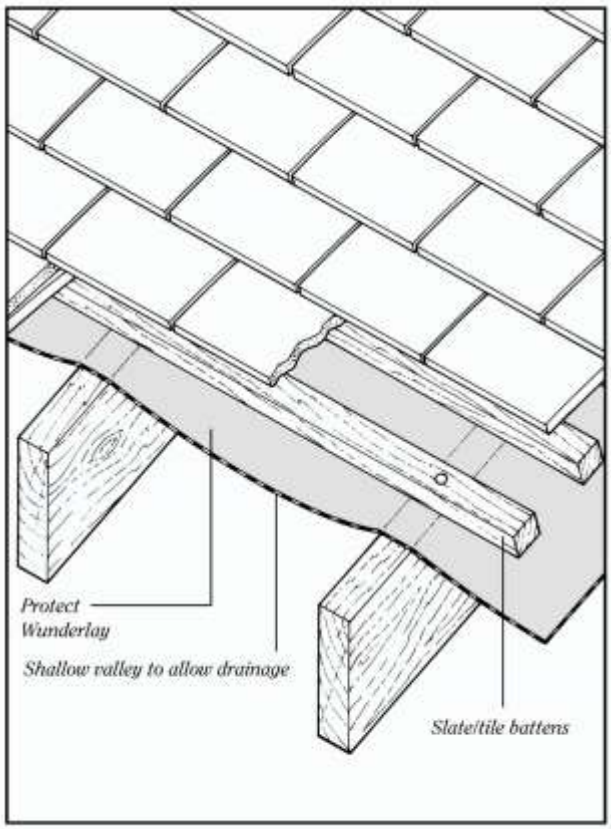
- Installation shall commence by unrolling Protect Wunderlay horizontally across the rafters starting at the eaves and working towards the ridge of the roof. The printed side shall face upwards and each horizontal run shall be slightly draped in accordance with the recommendations of BS 5534 to avoid excess sagging, creases and gaps between underlay courses.
- The underlay shall be tack nailed in position and secured by through nailed horizontal battens, keeping the number of perforations to a minimum.
- The minimum width of the horizontal laps shall be as recommended in BS 5534 (reproduced in Table 2). Horizontal laps shall preferably be under a batten, but where a lap occurs between battens, it shall be held down with an extra batten. Vertical joints shall overlap by at least 150 mm and shall be secured on a rafter.
- Corrosion resistant staples or clout nails shall be used and shall comply with the requirements of BS 5534.
- Protect Wunderlay has adequate resistance to tearing, but is not designed to withstand the weight of operatives or tiles being loaded out and battens shall therefore be installed as work progresses from eaves to ridge for achieving purchase for feet and avoiding damage to the underlay surface. No materials or implements shall be rested on the underlay.
- It shall be ensured that the roof design and construction allows for adequate ventilation of the roof space by providing sufficient eaves openings, Figure 1, or tile/ridge ventilators with an equivalent opening area. Due care shall be taken in ensuring that the underlay does not obstruct the flow of air at any ventilation opening.
- In order to prevent the underlay sagging behind the fascia and forming a water trap, the underlay shall be supported at the eaves with a Protect PVC-U eaves skirt (not part of this assessment) so that run off water is directed into the gutter (See Figure 2). The first roll of Protect Wunderlay shall be cut to overlap the eaves skirt.
- Courses of the underlay over a hip shall be overlapped by the minimum amounts stated in Table 2. Each course shall overlap the underlay course(s) on the adjacent elevation of the roof.
- At ridges, the product shall be dressed over the adjoining pitch at the apex. Where the overlap prescribed in BS 5534: Part 1 is insufficient, a 600 mm wide strip of underlay shall be overlaid centrally above the junction. In valleys, a strip of underlay, at least 600 mm shall be laid over the gutter bed, but under the roof underlay, and be held down by valley battens where used. The main roof underlay shall be dressed over the valley battens in this case.

- Exposure to UV light in tests has indicated that Protect Wunderlay shall not be dressed over the guttering at the eaves as the sole means of directing run-off water into the guttering. A compatible proprietary eaves skirt, such as a Protect PVC-U skirt, or eaves strip membrane should be used for this purpose. These however have not been assessed as part of this certification and are therefore outside the scope of this certification.
- If Protect Wunderlay is to be used with rigid timber sarking, then counter battens (minimum 12 mm deep) shall be located between the sarking and the underlay, with a maximum drape of the underlay limited to 10 mm. If Protect Wunderlay is laid directly onto the sarking, counter battens and tiling battens shall be used above to prevent trapping of moisture on the top surface of the underlay. In all cases of use, the cold roof loft space below the sarking boards shall be fully ventilated as specified in BS 5250. The practice of nailing slates into the rigid sarking through the underlay (also known as Scottish practice) can be undertaken with Protect Wunderlay but as with any underlay this practice does penetrate the waterproof layer thereby reducing its performance in this respect. The designer should ensure that a sufficient roof pitch is used to reduce the risk of water penetration through the primary roof covering.
- Standard methods of workmanship shall be used to apply Protect Wunderlay at penetrations and abutments. It shall be ensured that the underlay is turned up not less than 50 mm at all abutments to be overlapped by the flashings, and that it overlaps the lining tray by not less than 100 mm at the back face of any abutment.
- Penetrations by soil and vent pipes, and similar, the underlay shall be carefully star-cut to prevent tears, then closely fitted over the pipe, ensuring that all tabs project upwards along the pipe.
- Repairs can be carried out by overlaying the damaged area with a layer of additional material ensuring a 150 mm overlap all round. It shall also be ensured that the up-slope side is overlapped by the next higher horizontal run of underlay and secured under a batten.

Table 2: Minimum Horizontal Overlap

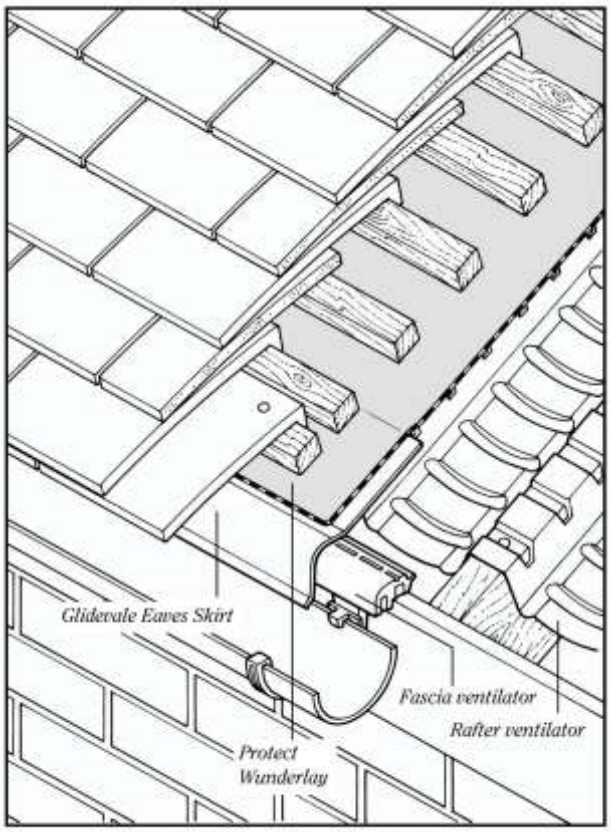
Rafter Pitch (Degree's)	Minimum Horizontal Lap (mm)
	Not Fully Supported
12.5 – 4	225
15 – 34	150
35 and above	100

Figure 1:



Typical installation detail

Figure 2:



Recommended treatment of roof ventilation

10 TEST AND VERIFICATION REQUIREMENTS

10.1 Test Reports and Sampling

BM TRADA has assessed the results of testing and sampling, and/or calculation that has been carried out in accordance with the scheme rules.

10.2 Initial Type Testing

10.2.1 Mechanical Resistance and Stability

Testing of the product has been carried out to determine the following properties and performance characteristics:

- Tensile Strength before and after UV and Heat Ageing
- Resistance to Nail Tearing before and after UV and Heat Ageing
- Water Tightness
- Water Vapour Resistance
- Dimensional Stability
- Elongation

The test results are summarised in the Tables below.

10.2.1.1 Table 3: Tensile Strength to BS EN 12311-1 modified by BS EN 13859-1

Direction	Protect Wunderlay	
	Before Ageing (N/50mm)	After Ageing (N/50mm)
Machine	233	231
Cross	246	206

10.2.1.2 Table 4: Elongation to BS EN 12311-1, Modified by BS EN 13859-1

Direction	Protect Wunderlay	
	Before Ageing (%)	After Ageing (%)
Machine	59	46
Cross	69	47

10.2.1.3 Table 5: Resistance to Nail Tearing to BS EN 12310-1 modified by BS EN 13859-1

Direction	Protect Wunderlay
	Before Ageing (N)
Machine	189
Cross	199

10.2.1.4 Table 6: Resistance to Water Penetration to BS EN 1928, modified by BS EN 13859-1

	Protect Wunderlay	
	Before Ageing	After Ageing
Class	W1	W1

10.2.1.5 Table 7: Water Vapour Resistance (Sd & MNs/g) to BS EN ISO 12572, Method C

	Protect Wunderlay
	Before Ageing
S_d	18.28
MNs/g	91.40

10.2.1.6 Table 8: Dimensional Stability to BS EN 1107-2

Direction	Protect Wunderlay
	(% Change)
Machine	-0.25
Cross	0.25

- Protect Wunderlay can be considered for design purposes, in accordance with BS 5250 and BS 5534 as an impermeable high water vapour resistance (HR) roof underlay. Provision shall be made in the roof design for ventilation equivalent to the requirements of BS 5534 and BS 5250 for each designed roof pitch. In roofs where insulation is installed at rafter level, a ventilation cavity, 50 mm deep shall be provided between the underlay

and insulation. The ventilation shall be equivalent to a 25 mm gap at low level and a 5 mm gap at high level. Additional guidance shall be obtained from BS 5250.

10.2.1.7 Table 9: Wind Loading

Batten Gauge (mm)	Resistance to Wind Pressure (Pa)	Zone Use
Up to 345	1367	1 to 4
Up to 310	2145	1 to 5

When tested for wind uplift to Annex A of BS 5534 Protect Wunderlay can resist the pressures given in Table 9 at the stated batten gauges and the zones in which it can be used.

Protect Wunderlay is satisfactory for use in unsupported systems where a well-sealed ceiling is present and the roof has a ridge height ≤15m, a pitch between 12.5^{o} and 75^{o}, and a site altitude ≤100m, and where topography is not significant.

Where batten spacing's are greater than 345 mm, underlay laps are less than 150 mm or rafter spacing exceeds 600 mm it shall be established by testing that the wind uplift forces do not produce a deflection in the underlay that will enable it to make contact with the back of the roof covering.

10.2.1.7 Safety in Case of Fire

The fire performance of Protect Wunderlay has not been determined. Fire performance shall be determined for the structure as a whole.

10.2.1.8 Reaction to Fire

Protect Wunderlay is likely to have similar fire properties to those of other polypropylene sheets. It will melt and shrink away from a heat source and will burn in the presence of an ignition source.

10.2.1.9 Resistance to Fire

Resistance to Fire would need to be assessed for the structure as a whole.

10.2.2 Hygiene, Health and Environment

10.2.2.1 Risk of Condensation

As Protect Wunderlay has a permeability less than 36g/m^2/day, it should not be used for fully supported applications. If the product is to be used with rigid timber sarking, counter battens (minimum 12mm deep) must be located between the sarking and the underlay to allow additional ventilation. In this circumstance the maximum drape of Protect Wunderlay is limited to 10mm to ensure that there is no contact with the sarking. In all cases of use, the loft space below the sarking must be ventilated as specified in BS 5250.

10.2.3 Safety in Use

Not relevant.

10.2.4 Protection against Noise

Protection against noise has not been evaluated. This shall be evaluated for the structure as a whole.

10.2.5 Energy Economy and Heat Retention

Thermal performance has not been evaluated. This shall be evaluated for the structure as a whole.

10.3 Aspects of Durability

In the opinion of BM TRADA Certification, Protect Wunderlay, if used in accordance with the requirements of this certificate, is considered to be as durable as traditional Roof underlay's in the building in which it is incorporated. This is on the provision that the roofing system is designed and installed in accordance with the relevant requirements of BS 5534: Part 1, BS 5250 and BS 8000: Part 6.

11 IDENTIFICATION AND USE OF THE BM TRADA AND Q-MARK LOGOS

Correct identification of approved Construction Products is vital in order that purchasers and controlling authorities clearly understand the status of products presented to them. It is therefore a requirement that all products or at least the packaging of the products, covered under the scheme are identified as "BM TRADA Q-Mark Certified" or with other similar wording, and/or display the Q-Mark badges. This will assist subsequent inspection authorities to recognise acceptable products. For similar reasons, Members are encouraged to make use of the Marks on marketing and Technical documentation.

12 GUARANTEES

The scheme makes no requirement on its Members to give a minimum guarantee. This is entirely up to the discretion of the Member.

13 ANNEX 1: EVIDENCE/DOCUMENTS USED IN THIS ASSESSMENT

1. BTTG High Performance Materials: Test Report HPM/10183/LP, Dated 07/02/05
2. Protect Limited Literature
3. BPD Quality Manual

14 ANNEX 2: NORMATIVE REFERENCES

1.	BS 747	Reinforced Bitumen Sheets for Roofing
2.	BS EN 1107-2	Flexible Sheets for Waterproofing – determination of Dimensional Stability
3.	BS EN 1109	Flexible Sheets for Waterproofing - Bitumen sheets for roof waterproofing: Determination of flexibility at low temperature
4.	BS EN 1296	Flexible Sheets for waterproofing – Bitumen, Plastic and Rubber Sheets for Waterproofing – Method of artificial ageing by long term exposure to elevated temperature.
5.	BS EN 1297	Flexible Sheets for Roofing – Determination of Resistance to UV and water Ageing – Part 1: Bitumen Sheets
6.	BS EN 1848-2	Flexible Sheets for waterproofing – Determination of length, width, straightness and flatness – Part 2: Plastic and Rubber sheets for waterproofing.
7.	BS EN 1849: Part 2	Flexible Sheets for Waterproofing - Determination of thickness and mass per unit area – Part 2: Plastic and rubber sheets for roof waterproofing
8.	BS EN 1850-2	Flexible Sheets for waterproofing – Determination of visible defects – Part 2 Plastic and rubber sheets for roof waterproofing
9.	BS EN 1928	Flexible Sheets for Waterproofing - Bitumen, plastic and rubber sheets for roof waterproofing – determination of water-tightness
10.	BS EN 1931	Flexible sheets for waterproofing – Bitumen, plastic and rubber sheets for roof waterproofing – Determination of water vapour transmission properties.
11.	BS EN 5250	Code of Practice for the control of Condensation in Buildings.
12.	BS EN 5534	Code of Practice for Slating and Tiling, including Shingles.
13.	BS EN 6399-2	Loading of Buildings: Code of Practice for Wind loads
14.	BS 8000-4	Workmanship on Building Sites – Codes of Practice for Waterproofing.
15.	BS 8000-6	Workmanship on Building Sites: Code of Practice for Slating and tiling of roofs and claddings
16.	BS EN 12310-1	Flexible sheets for waterproofing. Determination of resistance to tearing. Part 1: Bitumen sheets for waterproofing.
17.	BS EN 12311-1	Flexible sheets for waterproofing. Determination of tensile properties. Part 1: Bitumen sheets for roof waterproofing.
18.	BS EN 13501-1	Fire Classification of Construction Products and Building elements – Classification using data from Reaction to Fire Tests.
19.	BS EN 13859-1	Flexible Sheets for Waterproofing – Definitions and Characteristics of Underlay's – Part 1: Underlay's for discontinuous roofing
20.	BS EN ISO 9001	Quality Systems: model for Quality assurance in production, installation and servicing.
21.	BS EN ISO/IEC 17021	General Requirements for Bodies operating assessment and certification/registration of Quality Systems