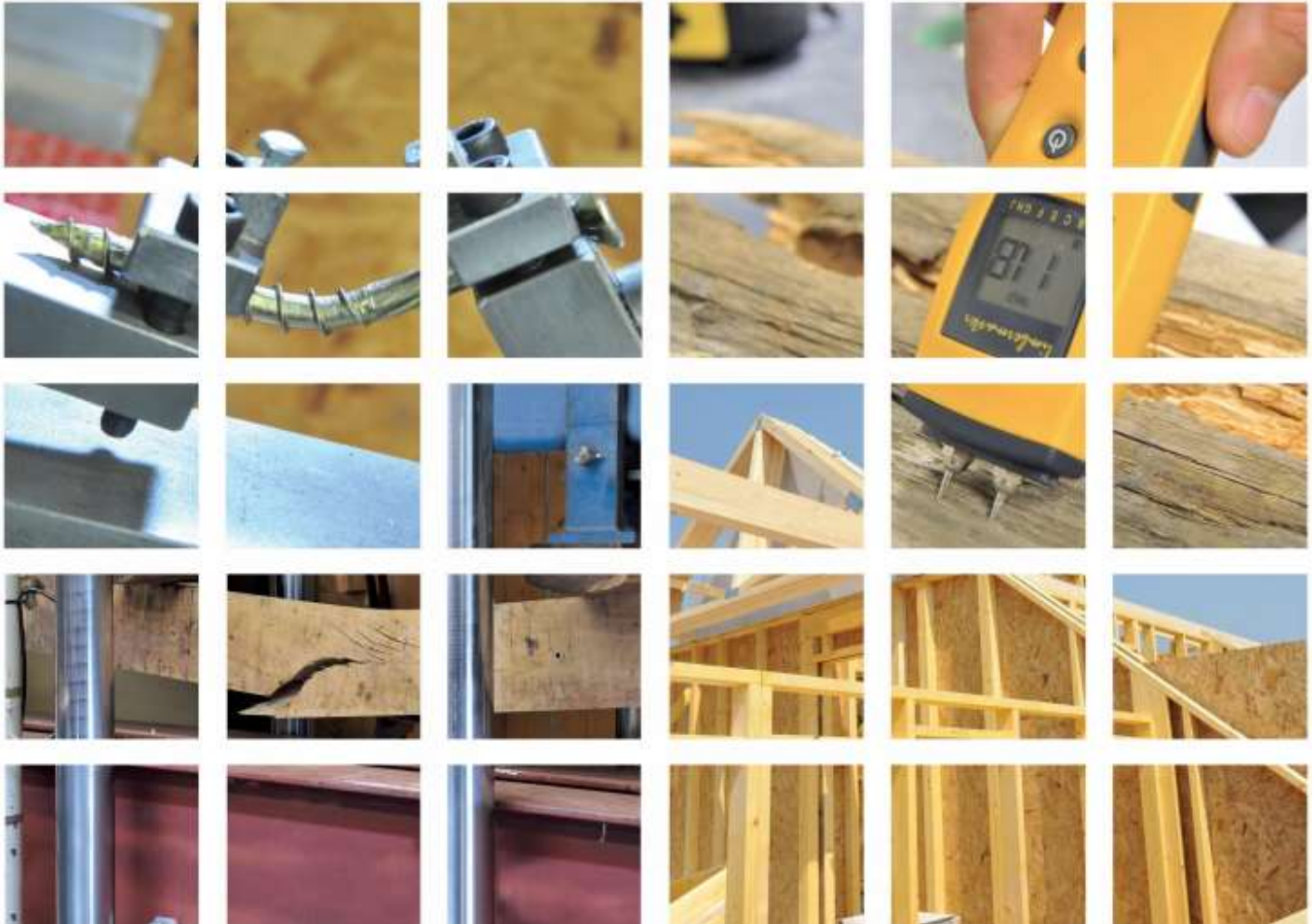


Q-Mark Registration Schedule

Vapour Permeable Roof Underlay

Protect Zytec

Protect Membranes
2 Brooklands Road
Sale
Cheshire
M33 3SS



Q-Mark Registration Schedule

| | | |
|--------------------------------------|-------------|--|
| Holder of Q-Mark | | Protect Membranes |
| Product Name | | Protect Zytec |
| Type and Use of Product | | Vapour Permeable Roof Underlay |
| Validity: | From | 02/06/2019 |
| | To | 01/06/2022 |
| Date of This Issue | | 02/06/2019 |
| Issue Number | | 5 |
| This Issue Replaces | | Revision 02/06/2016 |
| Relates to Certificate Number | | CPS-007 |
| Manufacturing Address/s | | 2 Brooklands Road Sale Cheshire M33 3SS |
| This Schedule Contains | | 16 Pages, including 2 Annexes |



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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 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 Zytec is a UV and heat stabilised polymeric roof underlay comprising of a microporous core with spunbound non-woven material laminated onto each surface. It is a low water vapour resistance (Type LR) underlay as defined in BS 5250 'Code of Practice for the Control of Condensation in Buildings'. The product is embossed grey with the brand name and 150 mm overlap line printed on the upper surface (as installed) and grey on the lower surface.

Protect Zytec provides a satisfactory underlay in tiled and slated pitched roofs constructed in accordance with BS 5534. It may be installed on new or existing buildings and is flexible at low temperatures and resistant to tearing by nails and to damage from handling on site.

4.1 Table 1: Nominal Characteristics

| Property | Protect Zytec |
|------------------------------------|---------------|
| Thickness (mm) | 0.72 |
| Mass/unit area (g/m ²) | 158 |
| Roll length (m) | 25; 50 |
| Roll width (m) | 1.5; 1.0 |

4.2 Intended Use

Under the scope of this certification, Protect Zytec has been approved for use in pitched roofs as a secondary, water vapour permeable, weather resistant layer, for protection against wind driven rain or snow and dust ingress.

5 BUILDING REGULATIONS

Protect Zytec 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 are 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 have 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 stored upright on a firm, level surface and preferably under cover. Rolls shall not be allowed to rest against sharp projections.
- Protect Zytac stacked in the open must be protected from accidental damage, and unwrapped material shall not be left exposed to 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

Protect Zytex vapour permeable underlay can be used for cold roofs with ventilated or unventilated loft spaces (see figures 1 & 2) or on insulation following rafters. (See figures 3 & 4).

In accordance with good building practice, this product shall be covered as soon as possible after installation and preferably not more than one month after initial exposure. Within this period, if correctly installed, Protect Zytex will provide temporary protection against rain prior to installation of slates or tiling. If the exposure periods exceeds one month, advice shall be sought from the manufacturer.

Protect Zytex shall not be laid or come into contact with any un-dried solvent timber preservative. Rolls shall be stored on a flat, dry surface, protected from the elements.

Protect Zytex can be easily cut with a sharp knife and remains flexible at normal working temperatures. It shall be fixed with corrosion resistant staples or clout nails of copper, aluminium alloy or galvanized steel.

9.4.2 Specific Installation

- The installation and fixing shall be in accordance with BS EN 5534, BS 8000: Part 6, the supplier's instructions and the requirements of this certificate, as the performance of the product is dependant on correct installation.
- Protect Zytex can be used with rigid sarking boards, or in a fully supported application. In these cases it shall be ensured that the roof design and construction allows for adequate ventilation of the roof space by providing sufficient eaves openings, or tile/ridge ventilators with an equivalent opening area. Use of counter battens shall be taken into consideration and care shall be taken that the underlay does not obstruct the flow of air at any ventilation opening.
- Where vapour permeable underlays such as Protect Zytex are used to contribute to condensation control, they do so by allowing water vapour to escape to atmosphere via the roof covering. Most concrete and clay tiles are sufficiently air ventilated but if a tight roof covering is installed, e.g. fibre cement slates and metal tiles etc, it is necessary to ventilate the batten space. In this case, 25 mm counter battens shall be used above the underlay and ventilation provided – 25,000 mm² per metre at eaves or low level and 5,000 mm² per metre at ridge or high level. (See figure 2)
- When laying Protect Zytex over counter battens or rafters, shallow valleys shall be allowed for (max 10 mm deep). This is to allow for any moisture on the upper surface of the underlay to drain away safely under the tiling/slating battens preventing ponding or wetting.
- 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. The first roll of Protect Zytex shall be cut to overlap the eaves skirt.
- Installation shall commence by unrolling Protect Zytex horizontally across the rafters starting at the eaves and working towards the ridge of the roof. The white surface shall face the rafters on unrolling while the printed side shall face upwards. Each horizontal run shall be slightly draped (maximum 10 mm) in accordance with the recommendations of BS 5534 to avoid excess sagging, creases and gaps between the underlay courses.
- It shall be tack-nailed in position and secured by through-nailed battens keeping the number of perforations to a minimum. The minimum width of horizontal laps shall be in accordance to Clause 6.2 of BS EN 5534 (reproduced in Table 2). Horizontal laps shall preferably be under a batten. Where a lap occurs between battens, consideration shall be given to either include an extra batten at the overlap or extending the overlap to coincide

with the next 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 EN 5534.

- The product has adequate resistance to tearing but is not designed to withstand large weights. Battens shall therefore be installed as work progresses from eaves to ridge for achieving foothold and avoiding damage to the underlay surface. 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 to BS EN 4892 has indicated that Protect Zytec should 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 Protect PVC-U skirt) or eaves strip membrane may be used for this purpose. These have however not been assessed and are therefore outside the scope of this certification.
- Standard methods of workmanship shall be used to apply Protect Zytec 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 the like shall be dealt with as follows: The underlay must be star cut carefully to prevent tears, closely fitted over the pipe, ensuring that all the tabs project upwards along the pipe.
- Repairs can be carried out by overlapping the damaged area with a layer of additional material ensuring a 150 mm overlap all around. Also ensure that the up-slope side is overlapped by the next horizontal run of underlay and secured under a batten.
- During its life, the external roof covering over Protect Zytec shall be subject to regular inspection and maintenance and any defects shall promptly be repaired.

Table 2: Minimum Laps

| Rafter Pitch (Degree's) | Horizontal Lap (mm) | Vertical Lap (mm) |
|-------------------------|---------------------|-------------------|
| 12.5 – 4 | 225 | 100 |
| 15 – 34 | 150 | 100 |
| 35 and above | 100 | 100 |

Figure 1: Cold Roof

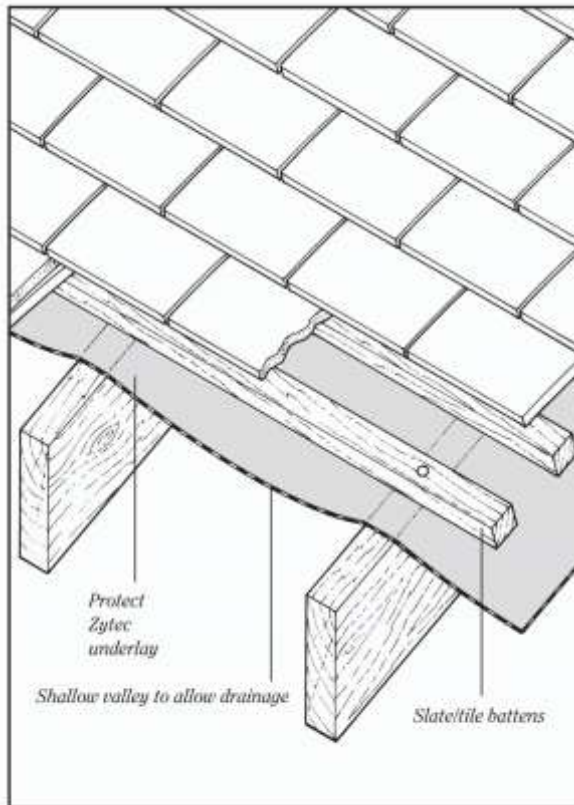


Fig 1

Figure 2: Tight Roof Coverings

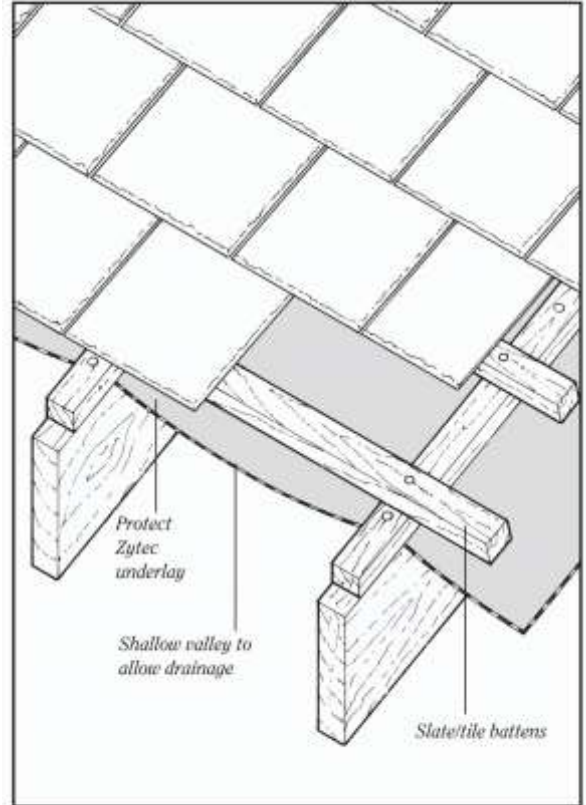


Fig 2

Figure 3: Insulation Following Rafter – Fully Supported

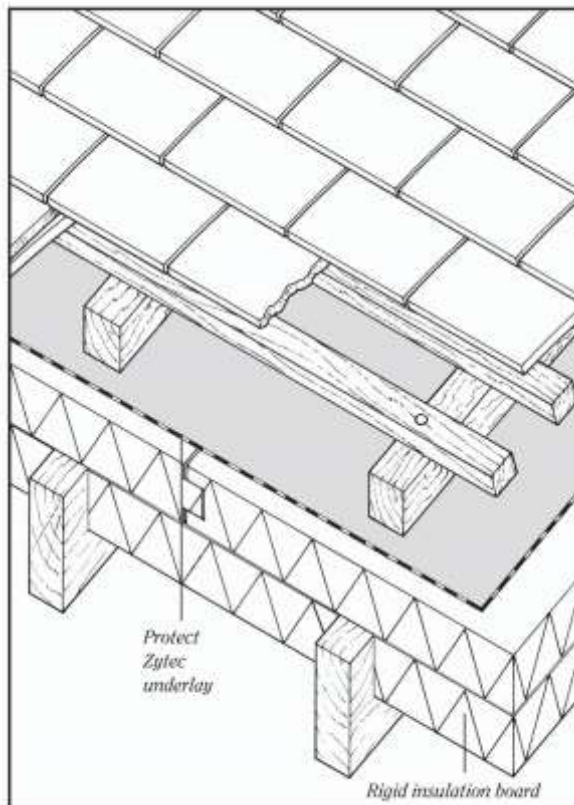


Fig 4

Figure 4: Insulation Following Rafter – Unsupported

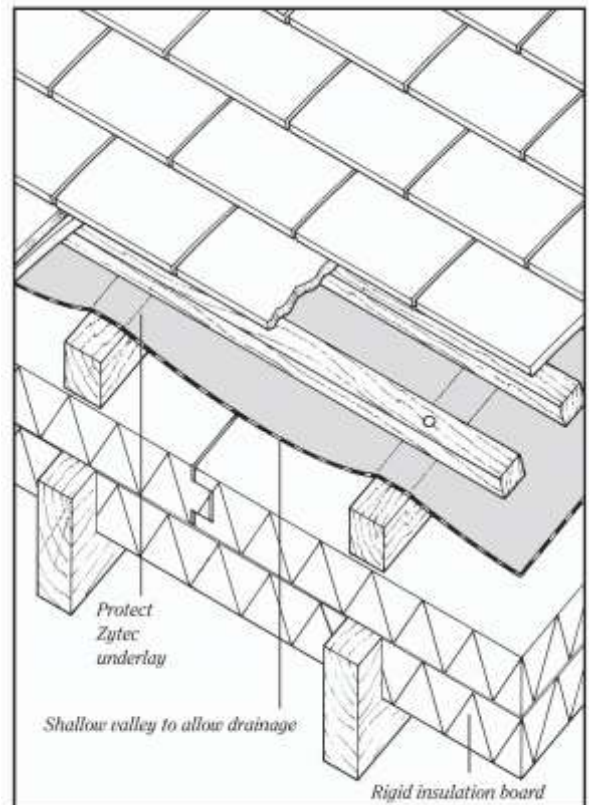


Fig 3

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

Test results are summarised in the Tables below.

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

| Direction | Protect Zytec | |
|-----------|------------------------|-----------------------|
| | Before Ageing (N/50mm) | After Ageing (N/50mm) |
| Machine | 273 | 220 |
| Cross | 230 | 198 |

10.2.1.2 Table 4: Elongation to BS EN 112311-1 modified by BS EN 13859-1

| Direction | Protect Zytec | |
|-----------|-------------------|------------------|
| | Before Ageing (%) | After Ageing (%) |
| Machine | 55 | 38 |
| Cross | 63 | 46 |

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

| Direction | Protect Zytec | |
|-----------|-------------------|--|
| | Before Ageing (N) | |
| Machine | 270 | |
| Cross | 216 | |

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

| | Protect Zytec | |
|-------|---------------|--------------|
| | 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 Zytec |
|----------------|---------------|
| | Before Ageing |
| S _d | 0.03 |
| MNs/g | 0.15 |

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

| Direction | Protect Zytec |
|-----------|---------------|
| | (% change) |
| Machine | -0.12 |
| Cross | 0.00 |

10.2.1.7 Table 9: Wind Loading

| Batten Gauge (mm) | Resistance to Wind Pressure (Pa) | Zone Use |
|-------------------|----------------------------------|----------|
| Up to 345 | 1519 | 1 to 4 |
| Up to 310 | 2188 | 1 to 5 |

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

Protect Zytec 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° and 75°, 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.

10.2.2 Safety in Case of Fire

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

10.2.2.1 Reaction to Fire

Protect Zytec 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.

10.2.2.2 Resistance to Fire

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

10.2.3 Hygiene, Health and Environment

10.2.3.1 Risk of Condensation

- In warm roofs, condensation can be controlled using a Type LR underlay with no additional ventilation, provided the ceiling is well sealed as defined in BS 5250. However, the use of counter battens is recommended. To ensure the integrity of a well sealed

ceiling, a separate vapour control layer shall also be used on the warm side of the insulation. Protect Zytec can be laid either fully supported on insulation or draped unsupported over rafters or counter battens. Consideration shall be given as to whether ventilation of the batten space above the underlay is required.

- In cold roofs, condensation in dwelling sized roofs can be controlled by the use of a Type LR underlay and a reduced level of ventilation from that required with a permeable (i.e. HR underlay). Typically this would be either 3,000 mm² per metre at eaves or low level, or 5,000 mm² per metre at ridge or high level. For any particular use of Protect Zytec, additional ventilation may be appropriate and the recommendations of BS 5250 shall always be followed.
- Water penetration resistance tests have confirmed that Protect Zytec is resistant to water penetration and when installed in a roof constructed to BS 5534 the material will resist the passage of water to the interior of the building.

10.2.4 Safety in Use

Not relevant

10.2.5 Protection against Noise

Protection against noise has not been evaluated.

10.2.6 Energy Economy and Heat Retention

Thermal performance has not been evaluated.

10.3 Aspects of Durability

In the opinion of BM TRADA Certification Protect Zytec, when used in accordance with the requirements of this certificate, is considered to be as durable as traditional roof underlays in the building in which it is incorporated. This is on the provision that the roofing system is designed, installed and maintained in accordance with the relevant requirements of BS 5534, 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 11/12597/LP, Dated 09/11/07
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 1849-2 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 5534 Code of Practice for Slating and Tiling, including Shingles.
11. BS EN 5250 Code of Practice for the control of Condensation in Buildings.
12. BS EN 6399-2 Loading of Buildings: Code of Practice for Wind loads
13. BS 8000-4 Workmanship on Building Sites – Codes of Practice for Waterproofing.
14. BS 8000-6 Workmanship on Building Sites: Code of Practice for Slating and tiling of roofs and claddings
15. BS EN 12310-1 Flexible sheets for waterproofing. Determination of resistance to tearing. Part 1: Bitumen sheets for waterproofing.
16. BS EN 12311-1 Flexible sheets for waterproofing. Determination of tensile properties. Part 1: Bitumen sheets for roof waterproofing.
17. BS EN 12572 Hygrothermal performance of building materials and products: Determination of water vapour transmission properties.
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