



<b>Number</b> BAR 09-346	 <p style="text-align: center;"><b>BDA Agrément Nr. BAR 09-346</b></p> <p style="text-align: center;"><b>Data Sheet Roof - Design</b></p> <p style="text-align: center;">To check the validity of this document please consult <a href="http://www.bda.nl">www.bda.nl</a></p>	<b>Category</b> Specific																																												
<b>Date</b> 2009.12.15		<b>Phase</b> Design																																												
<b>Code</b> 41MF99		<b>Subject</b> Multi-foil reflective thermal insulation for roofs																																												
<b>Product</b>  <b>Supplier</b>  <b>Description</b>  <b>Scope (objective)</b>  <b>Frame of reference</b>  <b>Product characteristics</b>  <b>Ancillary items</b>  <b>Points of attention</b>	<p><b>Super Quilt 19</b></p> <p>Yorkshire Building Services (Whitwell) Ltd. The Craggs Industrial Park Morven Street UK-S80 4AJ Creswell Derbyshire T.: +44 (0) 1909 721662, F.: +44 (0) 1909 721442 E.: technical@ybsinsulation.com, I.: www.ybsinsulation.com</p> <p>Multi-layered roof insulation material made up of nineteen layers of metallic foil, flexible wadding and closed cell foam. The layers are spot wise connected by 40 mm long double T plastic clips in a regular pattern, avoiding thermal bridging and creating flat surfaces. The first and nineteenth layer consist of aluminium foil with polyethylene backing and reinforcing scrim. The core of the product consists of three layers of polyester fibre wadding and four double layers of closed cell foam separated by six metallized film layers.</p> <p>Thermal insulation for use above and/or below rafters in tiled or slated pitched roofs of dwellings and buildings with similar temperature and humidity conditions, designed and constructed in accordance with the relevant clauses of BS 5534<sup>4</sup>.</p> <ol style="list-style-type: none"> <li>Directive for the issue of a BDA Agrément, May 2009</li> <li>BDA Agrément Nr. BAR 09-347 Super Quilt 19 (phase: installation)</li> <li>BDA Agrément Nr. BAR 09-348 Super Quilt 19 (phase: regulations)</li> <li>BS 5534: 2003 <i>Code of practice for slating and tiling (including shingles) – Installation</i></li> <li>BS 5250: 2002 <i>Code of practice for control of condensation in buildings</i></li> <li>BDA-Report 0036-L-09/3 SuperQuilt 19: <i>Determination of thermal resistance</i>, 2009.07.17</li> <li>BDA-Report 0036-L-09/4 SuperQuilt 19: <i>Determination of thermal resistance</i>, 2009.07.17</li> <li>BDA-Report 0036-L-09/6 SuperQuilt 19: <i>Determination of thermal resistance</i>, 2009.08.03</li> <li>Deutsches Institut für Bautechnik, Allgemeine bauaufsichtliche Zulassung, Nr. Z-23.11-1723: <i>Mehrlagige Verbund-Wärmedämm-Matte "SuperQuilt" als Wärmedämmstoff</i>, 10. September 2008</li> <li>Fraunhofer Test Report P17-084e/2008: <i>Approval Testing of Thermal Insulation Composite Mat „SuperQuilt 19 layers“</i>, 27. 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**Points of attention (continued)**

4. **Condensation risk**
  - roofs incorporating the product will adequately limit the risk of interstitial condensation when designed in accordance with BS 5250: 2002<sup>2</sup>;
  - when installed in accordance with BDA Agrément Nr. BAR 09-347 Super Quilt 19 (phase: installation<sup>2</sup>) the product will provide a convection-free envelope of high vapour resistance;
  - when installed against the external side of the studs or battens a vapour control layer could be considered in certain cases, this is to be judged by a specialist;
  - when installed against the internal side of the studs or battens the product will perform as a vapour barrier and should be used in conjunction with a suitable breather membrane against the sheathing on the external side of the studs or battens, see also ref.2.
5. **Behaviour in relation to fire**
  - when installed with an internal lining board, e.g. 12.5 mm thick plasterboard, the insulation will be contained between the external part of the roof and internal lining board, until one is destroyed. Therefore, the insulation will not contribute to the development stages of a fire or present a smoke or toxic hazard;
  - the insulation must not be carried over junctions between roofs and roofs required to provide a minimum period of fire resistance;
  - the continuity of fire resistance must be maintained, for example as described in: England and Wales- Approved Document B, Volume 1, Sections 5.11 to 5.12; Scotland-Mandatory Standard 2.2, clause 2.2.10; Northern Ireland-Technical Booklet E, paragraph 3.21;
  - the use of the product will not affect the fire rating obtained by brick or block roofs when evaluated by assessment or test to BS 476-3: 1958.
6. **Durability**  
The product is stable, rot-proof and durable and will remain effective as an insulant for the life of the building in which it is installed. There is no risk for moth or beetle infestation.

Table 1 – Possible thermal resistances ( $R_{eq}$  in  $m^2.K.W^{-1}$ ) of a combination of Super Quilt 19 with cavities, as measured under an angle of 45° under different heat flow conditions<sup>6,7,8</sup>

Combination	Winter conditions (heat flow from inside to outside)	Summer conditions (heat flow from outside to inside)
1. • High emissivity surface • 25 mm air cavity • Super Quilt 19 • 25 mm air cavity • High emissivity surface	2,71	2,83
2. • Low emissivity surface • 25 mm Air cavity • SuperQuilt 19 • 25 mm Air cavity • High emissivity surface	2,76	2,99
3. • Low emissivity surface • 25 mm Air cavity • SuperQuilt 19 • 25 mm Air cavity • Low emissivity surface	2,98	3,24
4. • High emissivity surface • 100 mm Glaswol • 25 mm Air cavity • SuperQuilt 19 • 25 mm Air cavity • High emissivity surface	5,37	Not measured
5. • Low emissivity surface • 25 mm Air cavity • SuperQuilt 19 • 50 mm Air cavity • SuperQuilt 19 • 25 mm Air cavity • Low emissivity surface	5,07	5,48

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Should damage occur, holes in the product should be repaired with suitable tape, as provided by the Agrément holder;</li> <li>the product should be attached to the rafters by using staples or nails of at least 14 mm length;</li> <li>the width of overlap joints must be at least 50 mm; the joints must be taped over the full length with suitable tape, as provided by the Agrément holder;</li> <li>when the product is cut to fit around openings or connections, gaps must be minimized; any exposed cut edges should be sealed with suitable tape, as provided by the Agrément holder.</li> </ul> </li> </ol>	• nominal length	: 10.00, 6.667	(m)	• nominal width	: 1500	(mm)	• nominal thickness	: 40	(mm)	• nominal mass	: 0.80	(kg.m <sup>-2</sup> )	• thermal performance core			- measured value <sup>9,10</sup>	: 1.48	(m <sup>2</sup> .K.W <sup>-1</sup> )	- calculation value <sup>9</sup>	: 1.38	(m <sup>2</sup> .K.W <sup>-1</sup> )	• thermal performance in combination with cavities	: see table 1		• dimensional stability (length)	: 1.5	(%)	• dimensional stability (width)	: 2.3	(%)	• tensile strength parallel to faces	: 142	(kPa)	• water vapour diffusion factor μ (with seam)	: 1700	(-)	• water vapour diffusion factor μ (without seam)	: 75000	(-)	• emission coefficients of outer surfaces	: 0.03	(-)	• reaction to fire classification	: E	
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**Installation procedure (continued)**


2. **Delivery and site handling**
  - the product is delivered to site in rolls packed in a protective bag sealed with a plastic tie. Fitting instructions are placed in the bag;
  - the rolls should be stored in clean, dry conditions, not exposed to sunlight;
  - the product must be protected from being dropped or crushed by objects. Care must be exercised when storing large quantities on site;
  - the product must not be exposed to open flame or other ignition sources and must be stored away from flammable material such as paint and solvents;
  - to ensure maximum performance of the product when installed, on site precautions must be taken to protect it from mud and dirt.
3. **Roof insulation**
  - the product shall be cut equal to the length of the sloping section plus 100 mm;
  - installation should start from the ridge with the product being unrolled parallel to the eaves across the rafters, after which it is fixed using staples or nails;
  - the product should be held in place using 32 mm by 25 mm wooden battens in such a way that there is a 25 mm air cavity above the product and a 25 mm air cavity below the product;
  - when installed above rafters a vapour barrier should be installed in conjunction with a suitable breather membrane under the tiles, without a ventilated air space;
  - when installed below rafters the product will perform as a vapour barrier and should be used in conjunction with a suitable breather membrane under the tiles, without a ventilated air space;
  - the breather membrane should be installed on the counter battens and tiling battens attached perpendicular to the rafters;
  - roof tiles or slates shall be installed in accordance with BS 5534: 2003<sup>4</sup>;
  - recommendations of the tile/slate manufacturer should be followed.
4. **Ceiling**
  - a foil-backed layer of plasterboard should be fixed to the battens in case of the roof insulation installed below the rafters. The batten size should be sufficient to ensure a 25 mm gap between the product and the plasterboard;
  - in case of the roof insulation installed above the rafters the foil-backed layer of plasterboard can be fixed directly to the rafters;
  - further details are given in BDA Agrément Nr. BAR 09-348 Super Quilt 19 (phase: regulations<sup>3</sup>).
5. **Maintenance and repair**
  - once installed, the product does not require any maintenance. Small holes, rips or punctures in the outer layers should be repaired with YBS Insulation tape.
6. **Regulations**

Further information on regulations is given in BDA Agrément Nr. BAR 09-348 Super Quilt 19 (phase: regulations<sup>3</sup>).

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<b>Product</b>  <b>Supplier</b>  <b>Description</b>  <b>Scope (objective)</b>  <b>Frame of reference</b>  <b>Product characteristics</b>  <b>Ancillary items</b>  <b>Regulations</b>	<p><b>Super Quilt 19</b></p> <p>Yorkshire Building Services (Whitwell) Ltd. The Craggs Industrial Park Morven Street UK-S80 4AJ Creswell Derbyshire T.: +44 (0) 1909 721662, F.: +44 (0) 1909 721442 E.: technical@ybsinsulation.com, I.: www.ybsinsulation.com</p> <p>Multi-layered roof insulation material made up of nineteen layers of metallic foil, flexible wadding and closed cell foam. The layers are spot wise connected by 40 mm long double T plastic clips in a regular pattern, avoiding thermal bridging and creating flat surfaces. The first and nineteenth layer consist of aluminium foil with polyethylene backing and reinforcing scrim. The core of the product consists of three layers of polyester fibre wadding and four double layers of closed cell foam separated by six metallized film layers.</p> <p>Thermal insulation for use above and/or below rafters in tiled or slated pitched roofs of dwellings and buildings with similar temperature and humidity conditions, designed and constructed in accordance with the relevant clauses of BS 5534<sup>6</sup>.</p> <ol style="list-style-type: none"> <li>Directive for the issue of a BDA Agrément, May 2009</li> <li>BDA Agrément Nr. BAR 09-346 Super Quilt 19 (phase: design)</li> <li>BDA Agrément Nr. BAR 09-347 Super Quilt 19 (phase: installation)</li> <li>BS 5250: 2002 <i>Code of practice for control of condensation in buildings</i></li> <li>BS 5268 <i>Code of practice for timber</i></li> <li>BS 5534: 2003 <i>Code of practice for slating and tiling (including shingles) – Regulations</i></li> <li>BS 4016:1997 <i>Specification for flexible building membranes (breather type)</i></li> </ol> <table border="0"> <tr> <td>• nominal length</td> <td>: 10.00, 6,667</td> <td>(m)</td> </tr> <tr> <td>• nominal width</td> <td>: 1500</td> <td>(mm)</td> </tr> <tr> <td>• nominal thickness</td> <td>: 40</td> <td>(mm)</td> </tr> <tr> <td>• nominal mass</td> <td>: 0.80</td> <td>(kg.m<sup>-2</sup>)</td> </tr> <tr> <td>thermal performance core</td> <td></td> <td></td> </tr> <tr> <td>- measured value<sup>2</sup></td> <td>: 1.48</td> <td>(m<sup>2</sup>.K.W<sup>-1</sup>)</td> </tr> <tr> <td>- calculation value<sup>2</sup></td> <td>: 1.38</td> <td>(m<sup>2</sup>.K.W<sup>-1</sup>)</td> </tr> <tr> <td>• thermal performance in combination with cavities</td> <td>: see table 1 in ref. 2</td> <td></td> </tr> <tr> <td>• dimensional stability (length)</td> <td>: 1.5</td> <td>(%)</td> </tr> <tr> <td>• dimensional stability (width)</td> <td>: 2.3</td> <td>(%)</td> </tr> <tr> <td>• tensile strength parallel to faces</td> <td>: 142</td> <td>(kPa)</td> </tr> <tr> <td>• water vapour diffusion factor μ (with seam)</td> <td>: 1700</td> <td>(-)</td> </tr> <tr> <td>• water vapour diffusion factor μ (without seam)</td> <td>: 75000</td> <td>(-)</td> </tr> <tr> <td>• emission coefficients of outer surfaces</td> <td>: 0.03</td> <td>(-)</td> </tr> <tr> <td>• reaction to fire classification</td> <td>: E</td> <td></td> </tr> </table> <ul style="list-style-type: none"> <li>YBS Insulation foil-backed tape with acrylic adhesive, width 75 mm</li> <li>14 mm staples or nails</li> <li>vapour control layer</li> <li>breather membrane</li> <li>pre-treated counter battens, softwood battens and tiling laths</li> <li>roofing slates or tiles</li> <li>additional insulation where required</li> </ul> <ol style="list-style-type: none"> <li><b>Requirements: The Building Regulations (England and Wales) 2000 (as amended)</b> <ul style="list-style-type: none"> <li>B3(4) Internal fire spread (structure) – Junctions between roofs and compartment walls must be fire stopped. Super Quilt 19 has a Class 1 surface spread of flame rating. The insulation must not be carried over junctions between roofs and walls required to provide a minimum period of fire resistance.</li> <li>C4 Resistance to weather and moisture – Super Quilt 19 can adequately resist the passage of moisture to the underlying structure, provided the roof is constructed in accordance with BS 5534: 2003<sup>6</sup> and the requirements of BDA Agrément nr. 09-347 Super Quilt 19 (phase: installation<sup>3</sup>).</li> <li>J3 Protection of the building from heat-producing appliances – in order to comply with this Regulation Super Quilt 19 must be adequately separated or shielded from a chimney, flue, fireplace recess, heat-producing appliance or hearth. The separations recommended, where appropriate, are detailed in Approved Document J supporting these Regulations, to which reference must be made.</li> <li>L1 Conservation of fuel and power – roofs constructed using Super Quilt 19 can be designed and constructed to provide a U-value of no greater than 0.35 W.m<sup>2</sup>K<sup>-1</sup>.</li> <li>Regulation 7 Materials and workmanship – Super Quilt 19 is manufactured from suitably safe and durable materials for their application and can be installed to give a satisfactory performance.</li> </ul> </li> </ol>	• nominal length	: 10.00, 6,667	(m)	• nominal width	: 1500	(mm)	• nominal thickness	: 40	(mm)	• nominal mass	: 0.80	(kg.m <sup>-2</sup> )	thermal performance core			- measured value <sup>2</sup>	: 1.48	(m <sup>2</sup> .K.W <sup>-1</sup> )	- calculation value <sup>2</sup>	: 1.38	(m <sup>2</sup> .K.W <sup>-1</sup> )	• thermal performance in combination with cavities	: see table 1 in ref. 2		• dimensional stability (length)	: 1.5	(%)	• dimensional stability (width)	: 2.3	(%)	• tensile strength parallel to faces	: 142	(kPa)	• water vapour diffusion factor μ (with seam)	: 1700	(-)	• water vapour diffusion factor μ (without seam)	: 75000	(-)	• emission coefficients of outer surfaces	: 0.03	(-)	• reaction to fire classification	: E	
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<b>Number</b> BAR 09-348	 <p style="text-align: center;"><b>BDA Agrément Nr. BAR 09-348</b></p> <p style="text-align: center;"><b>Data Sheet Roof - Regulations</b></p> <p style="text-align: center;">To check the validity of this document please consult <a href="http://www.bda.nl">www.bda.nl</a></p>	<b>Category</b> Specific
<b>Date</b> 2009.12.15		<b>Phase</b> Regulations
<b>Code</b> 41MF99		<b>Subject</b> Multi-foil reflective thermal insulation for roofs
<b>Regulations (continued)</b>	<p><b>2. Requirements: The Building (Scotland) Regulations 2004</b></p> <p><b>2.1 Regulations 8 (1) Durability of materials and workmanship</b></p> <ul style="list-style-type: none"> <li>- Super Quilt 19 is manufactured from acceptable materials and are considered to be adequately resistant to deterioration and wear under normal service conditions, provided they are installed in accordance with the requirements of BDA Agrément nr. 09-347 Super Quilt 19 (phase: installation<sup>3</sup>).</li> </ul> <p><b>2.2 Regulation 9 Building Standards Construction</b></p> <p>Section 2 Fire</p> <ul style="list-style-type: none"> <li>- cavity barriers - combustible materials are permitted in the roof cavity but require any opening to be sealed. The insulation must not be carried over junctions between roofs and walls required to provide a minimum period of fire resistance.</li> <li>- 2.5 Heat-producing, solid fuel burning or oil- or gas-fired installations - a roof, incorporating Super Quilt 19 can be designed and constructed to comply with these Standards, provided that they are isolated from the flue of a gas-fired, or solid fuel, or oil-fired heat-producing appliance by a separation. The insulation must be adequately separated from a fire place opening, recess, hearth or flue pipe, or from any heat-producing appliance.</li> </ul> <p>Section 3 Environment</p> <ul style="list-style-type: none"> <li>- 3.10 Precipitation – Super Quilt 19 can adequately resist the passage of moisture to the underlying structure provided the roof is constructed in accordance with BS 5534: 2003<sup>6</sup> and the requirements of this Agrément.</li> <li>- 3.15 Condensation – a roof formed using Super Quilt 19 in accordance with the requirements of BDA Agrément nr. 09-347 Super Quilt 19 (phase: installation<sup>3</sup>) and of BS 5250<sup>4</sup>, can be designed and constructed to comply with these Standards.</li> </ul> <p>Section 6 Energy</p> <ul style="list-style-type: none"> <li>- 6.1(b) Where a proposed roof U-value is not better than (or is greater than in Scotland) the relevant 'notional' value, additional energy saving measures will be required in the building envelope and/or services to achieve the required overall carbon dioxide emission rate reduction of about 20% in dwellings (18% to 25% in Scotland) and 23% to 28% in buildings other than dwellings.</li> <li>- 6.2.1. Conservation of fuel and power: the building fabric - external cavity roofs can be designed and constructed with Super Quilt 19 to provide a U-value of less than 0.35 W.m<sup>2</sup>K<sup>-1</sup>.</li> </ul> <p><b>3. Requirements: The Building Regulations (Northern Ireland) 2000</b></p> <ul style="list-style-type: none"> <li>- B2 Fitness of materials and workmanship – Super Quilt 19 is manufactured from materials which are considered to be suitably safe and acceptable for use as vapour open roof cavity rain barrier.</li> <li>- C5 Resistance to moisture and weather – where Super Quilt 19 is installed within a timber frame roof, that roof can be designed and constructed so as to prevent the passage of moisture or water vapour through it. Advice is given in ref. 3.</li> <li>- C7 Condensation - a roof incorporating Super Quilt 19 can be designed and constructed to prevent any harmful effect from moisture in the form of interstitial condensation.</li> <li>- E5(b) The product will not affect the external fire rating of a tiled or slated roof in which it is installed.</li> <li>- F2 Conservation of fuel and power – Timber frame roofs, incorporating Super Quilt 19 between the roof insulation and tiles, can be designed and constructed to provide a U-value no greater than 0.35 W.m<sup>-2</sup>.K<sup>-1</sup>.</li> <li>- F3(2) The product can contribute to a building satisfying its Target Emission Rate.</li> <li>- L2 Heat-producing appliances and associated constructions – a roof, incorporating Super Quilt 19 can be designed and constructed to comply with these Regulations, provided that the insulation is isolated from the flue of a gas-fired, or solid fuel of oil-fired heat-producing appliance or an incinerator. They must be adequately separated from a chimney or fireplace recess, from a flue pipe, from a hearth or from the appliance.</li> </ul>	
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