



Designated by Government
to issue
European Technical
Approvals

KEMPEROL 2K-PUR ROOF WATERPROOFING SYSTEM

Revêtement d'étanchéité pour toitures
Dachabdichtungen

Product



• THIS CERTIFICATE RELATES TO THE KEMPEROL 2K-PUR ROOF WATERPROOFING SYSTEM, A COLD LIQUID-APPLIED, SOLVENT-FREE SYSTEM BASED ON POLYURETHANE.

- The system is for use on flat, pitched, inverted or protected roofs with limited access.
- The system may also be used for waterproofing balconies, terraces and podiums.
- The components of the system are manufactured in Germany by Kemper System GmbH & Co KG.
- The system should only be installed by trained installers. Details of these are available from the Certificate holder.

Regulations

1 The Building Regulations 2000 (as amended) (England and Wales)



The Secretary of State has agreed with the British Board of Agrément the aspects of performance to be used by the BBA in assessing the compliance of roof waterproofing system with the Building Regulations. In the opinion of the BBA, the Kemperol 2K-PUR Roof Waterproofing System, if used in accordance with the provisions of this Certificate, will meet or contribute to meeting the relevant requirements.

Requirement: B4(2)

External fire spread

Comment:

Test data to BS 476-3 : 1958 indicate that on suitable substructures the use of the system will enable a roof to be unrestricted under this Requirement. See sections 12.1 and 12.2 of this Certificate.

Requirement: C2(b)

Resistance to moisture

Comment:

Tests for water resistance on the system, including joints, indicate that the system meets this Requirement. See sections 9.1 and 9.2 of this Certificate.

Requirement: Regulation 7

Materials and workmanship

Comment:

The system comprises acceptable materials. See section 15 of this Certificate.

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2 The Building (Scotland) Regulations 2004



In the opinion of the BBA, the Kemperol 2K-PUR Roof Waterproofing System, if used in accordance with the provisions of this Certificate, will satisfy or contribute to satisfying the various Regulations and related Mandatory Standards listed below.

| | | |
|-------------|------|---|
| Regulation: | 8 | Fitness and durability of materials and workmanship |
| Regulation: | 8(1) | Fitness and durability of materials and workmanship |
| Comment: | | The system can contribute to a construction meeting this Regulation. See section 15 and the <i>Installation</i> part of this Certificate. |
| Regulation: | 9 | Building standards – construction |
| Standard: | 2.8 | Spread from neighbouring buildings |
| Comment: | | Test data to BS 476-3 : 1958 indicate that the system, when applied to a non-combustible substrate, can be regarded as having low vulnerability, with reference to clause 2.8.1 ⁽¹⁾⁽²⁾ . See sections 12.1 and 12.2 of this Certificate. |
| Standard: | 3.10 | Precipitation |
| Comment: | | Tests for water resistance of the system indicate that the use of the system will enable a roof to satisfy the requirements of this Standard, with reference to clauses 3.10.1 ⁽¹⁾⁽²⁾ and 3.10.7 ⁽¹⁾⁽²⁾ . See sections 9.1 and 9.2 of this Certificate. |
| Regulation: | 12 | Building standards – conversions |
| Comment: | | All comments given for the system under Regulation 9, also apply to this Regulation, with reference to clause 0.12.1 ⁽¹⁾⁽²⁾ and Schedule 6 ⁽¹⁾⁽²⁾ . (1) Technical Handbook (Domestic). (2) Technical Handbook (Non-Domestic). |

3 The Building Regulations (Northern Ireland) 2000



In the opinion of the BBA, the Kemperol 2K-PUR Roof Waterproofing System, if used in accordance with the provisions of this Certificate, will satisfy or contribute to satisfying the various Building Regulations listed below.

| | | |
|-------------|----|---|
| Regulation: | B2 | Fitness of materials and workmanship |
| Comment: | | The system is acceptable. See section 15 of this Certificate. |
| Regulation: | C4 | Resistance to ground moisture and weather |
| Comment: | | Tests for water resistance of the system, including joints, indicate that the use of the system will enable a roof to satisfy the requirements of this Regulation. See sections 9.1 and 9.2 of this Certificate. |
| Regulation: | E5 | External fire spread |
| Comment: | | Test data to BS 476-3 : 1958 indicate that on suitable substructures the use of the system will enable a roof to be unrestricted under the requirements of this Regulation. See sections 12.1 and 12.2 of this Certificate. |

4 Construction (Design and Management) Regulations 1994 (as amended) Construction (Design and Management) Regulations (Northern Ireland) 1995 (as amended)

Information in this Certificate may assist the client, planning supervisor, designer and contractors to address their obligations under these Regulations.

See section: *6 Delivery and site handling* (6.1, 6.3 and 6.4) and the *Installation* part of this Certificate.

5 Description

5.1 The Kemperol 2K-PUR Roof Waterproofing System is a cold, liquid-applied solvent-free polyurethane membrane reinforced with a polyester fleece.

5.2 The system is applied to provide a waterproofing layer with a minimum thickness of 2 mm.

5.3 The system is built up by mixing and applying the required combination of the following components in the correct proportions on site:

- Kemperol 2K-PUR resin — a two-component, liquid-applied resin that cures to form a flexible waterproofing membrane
- Kemperol Fleece 165 — a polyester fleece for embedding into the Kemperol 2K-PUR resin to act as a reinforcement. The fleece has nominal characteristics of:

| | |
|---|--|
| weight per unit area ($\text{g}^{-1}\text{m}^{-2}$) | $165 \pm 10\%$ |
| tensile strength $\text{N}(50 \text{ mm})^{-1}$ | ≥ 250 |
| elongation at break (%) | ≥ 40 |
| roll length (m) | 50 |
| roll width (mm) | 105, 150, 210, 265, 350, 525, 700 and 1050 |

- Kemperol EP primer — a two-component, epoxy-based primer for use on concrete substrates prior to the application of Kemperol 2K-PUR resin
- Kemperol D primer — a two-component polyurethane primer for use on mastic asphalt, PVC, GRP, steel and plywood substrates prior to the application of Kemperol 2K-PUR resin
- Kemperol R primer — a rapid-cure two-component polyurethane primer for use on mastic asphalt, PVC, GRP, steel and plywood substrates prior to the application of Kemperol 2K-PUR resin
- Kemperol 2K-PUR accelerator — accelerator added to the Kemperol 2K-PUR resin when ambient temperatures are below 10°C
- Kemperol AC primer — a two-component methyl methacrylate primer for use on mastic asphalt substrate prior to the application of Kemperol 2K-PUR resin
- Kemperol FPO primer — single-component primer for use on polyolefin plastic substrates prior to the application of Kemperol 2K-PUR resin
- Kemperdur natural quartz (0.4 mm–1.2 mm) — a kiln-dried, natural quartz sand for scattering into the Kemperol EP primer to produce a key for the Kemperol 2K-PUR resin
- Kemperdur coloured quartz (0.4 mm to 0.8 mm) — a kiln-dried quartz sand, available in a range

of colours, for scattering into the surface of Kemperol 2K-PUR on balconies where increased resistance to foot traffic is required and to provide a non-slip surface.

5.4 Ancillary materials available are:

- Kemperol Reinforcement Strip — used to reinforce joints in the fleece when a flush joint detail is required
 - Kemperol finishing coats — a range of finishing/topcoats⁽¹⁾
- (1) Details are available from the Certificate holder.
- Kemperol cleaning solvent — MEK cleaning solvent for degreasing and cleaning equipment.

Quality control

5.5 A series of quality control checks are performed on incoming raw materials, during production and on the finished components.

6 Delivery and site handling

6.1 Components of the system are delivered to site in pre-weighed packs ready to mix and/or apply. The products are packaged as described in Table 1.

Table 1 Details of packaging

| Product | Packaging type | Quantity (kg) |
|--|----------------|---------------|
| Kemperol 2K-PUR components A and B composite packs | Foil sachet | 2.5 |
| Kemperol 2K-PUR components A and B composite packs | Metal cans | 5, 12.5 |
| Kemperol 2K-PUR accelerator | Funnel tins | 0.04, 0.08 |
| Kemperol D primer components A and B composite packs | Foil sachet | 1 |
| Kemperol D primer components A and B composite packs | Metal cans | 3, 5 |
| Kemperol R primer components A and B composite packs | Foil sachet | 1 |
| Kemperol R primer components A and B composite packs | Metal cans | 3 |
| Kemperol EP primer components A and B composite packs | Metal cans | 1, 3, 10 |
| Kemperol AC primer component A | Metal can | 1, 3, 5 |
| Kemperol AC primer component B (Hardener) ⁽¹⁾ | Plastic bag | 0.02, 0.1 |
| Kemperol FPO primer | Metal can | 0.5, 1, 3 |
| Kemperol MEK cleaning solvent | Tins | 2, 9 |

(1) Quantity to be added depends on the pack size of component A and material temperature.

6.2 Each container is marked with the manufacturer's name, product description and the appropriate hazard and risk labels.

6.3 All containers should be stored under cover in a cool, (less than 20°C), dry and ventilated place away from other chemicals. The products must be protected from frost. Components kept in sealed containers can be stored for at least six months. Reference must be made to the manufacturer's technical data sheets for information relating to specific products.

6.4 The materials classified under The Chemicals (Hazard Information and Packaging for Supply) Regulations 2002 (CHIP3) bear the appropriate

hazard warning label. The flashpoints and classification of components are given in Table 2.

Table 2 Flashpoint and hazard classification of components

| Product/component | Flashpoint (°C) | Classification |
|---------------------------------------|--------------------|--|
| Kemperol 2K-PUR component A | >100 | – |
| component B | >200 | Harmful |
| Kemperol 2K-PUR accelerator | 175 | – |
| Kemperol D primer component A | >200 | – |
| component B | >200 | Harmful |
| Kemperol R primer component A | >200 | – |
| component B | >200 | Harmful |
| Kemperol EP primer component A | >140 | Irritant |
| component B | >110 | Corrosive |
| Kemperol AC primer component A | 10 | Irritant, Highly flammable ⁽¹⁾ |
| component B (Hardener) ⁽¹⁾ | 180 ⁽²⁾ | Irritant, Oxidising agent |
| Kemperol FPO primer | –18 | Harmful, Extremely flammable ⁽¹⁾ |
| Kemperol MEK cleaning solvent | –4 | Irritant, Extremely flammable ⁽¹⁾ |

(1) These components should be stored in accordance with the Highly Flammable Liquids and Liquefied Petroleum Gases Regulations (1972).

(2) Self-accelerating decomposition temperature (SADT) = 60°C.

Design Data

7 General

7.1 The Kemperol 2K-PUR Roof Waterproofing System is satisfactory for use as waterproofing on flat (including completely flat), or pitched roofs, for new work or for repairing or maintaining the waterproof layer of existing structurally sound roofs with limited access.

7.2 Installation must be carried out only by specialist contractors approved by the Certificate holder. Details of these are available from the Certificate holder.

7.3 When designing flat roofs, twice the minimum finished fall should be assumed, unless a detailed analysis of the roof is available, including overall and local deflection and direction of falls. Flat roofs are defined for the purpose of this Certificate as those roofs having a minimum finished fall of 1:80. Pitched roofs are defined as those having falls in excess of 1:6.

7.4 Decks to which the system is to be applied must comply with the relevant requirements of BS 8218 : 1998, BS 8217 : 2005 or, where appropriate, NHBC Standards, Chapter 7.1, or the *Zurich Building Guarantee Technical Manual*, Section 4 *Superstructure*, sub-section *Flat roofs*, pages 266 to 268.

7.5 Limited access roofs are defined for the purpose of this Certificate as those roofs subjected only to pedestrian traffic for maintenance of the roof

covering and cleaning of gutters. Areas designed as balconies, terraces or podiums should be protected with a traditional finish such as paving slabs, tiles or decking, or a suitable resin wear course⁽¹⁾.

(1) This can be supplied by the Certificate holder, whose advice should be sought when considering such application.

8 Substrates

8.1 Before the system can be applied the substrate must be prepared and treated with the appropriate primer in accordance with the manufacturer's instructions.

8.2 Suitable substrates and primers include those listed in Table 3.

Table 3 Suitable substrates and primers

| Substrate | Primer |
|-------------------------------------|----------|
| Concrete | EP, D, R |
| Mastic asphalt (roofing grade) | D, R, AC |
| Plywood | D, R |
| Steel | D, R |
| Glass-faced polyurethane insulation | D, R |
| GRP | D, R |
| Plasticised PVC ⁽¹⁾ | D, R |
| Polyolefin plastics ⁽¹⁾ | FPO |

(1) Due to the variable nature of these materials, acceptable adhesion should be confirmed by test.

8.3 The suitability of other substrates should be determined by test.

9 Weathertightness

9.1 Data confirm that Kemperol 2K-PUR will adequately resist the passage of moisture to the inside of the building and so meet the requirements of national Building Regulations thus:

England and Wales

Approved Document C, Requirement C2(b), Section 6

Scotland

Regulation 9, Mandatory Standard 3.10, clauses 3.10.1⁽¹⁾⁽²⁾ and 3.10.7⁽¹⁾⁽²⁾

(1) Technical Handbook (Domestic).

(2) Technical Handbook (Non-Domestic).

Northern Ireland

Regulation C4.

9.2 The system will maintain its integrity as a weathertight membrane under normal conditions of exposure and can accept, without damage, minor movements of the substrate.

10 Adhesion

The adhesion of the system to the substrates listed in Table 3 is sufficient to resist the effects of wind suction, elevated temperature, thermal shock or structural movement likely to occur in practice. Acceptable adhesion to other substrates should be confirmed by test, if necessary.

11 Resistance to foot traffic

11.1 The system can accept, without damage, the limited foot traffic and light concentrated loads associated with installation and maintenance operations. Reasonable care is required, however, to avoid puncture by sharp objects.

11.2 Persons on the roof should wear soft-soled footwear and any equipment carried onto the roof should be placed on suitable protection in order to prevent damage to the system.

12 Properties in relation to fire



12.1 When tested in accordance with BS 476-3 : 1958, a system comprising 12 mm thick Supalux board covered with the system achieved an EXT.F.AA rating.

12.2 The designation of other specifications (eg on combustible substrates) should be confirmed by:

England and Wales

Test or assessment in accordance with Approved Document B, Appendix A, clause 1

Scotland

Test to conform to Mandatory Standard 2.8, clause 2.8.1⁽¹⁾⁽²⁾

(1) Technical Handbook (Domestic).

(2) Technical Handbook (Non-Domestic).

Northern Ireland

Test or assessment by a UKAS accredited laboratory, or an independent consultant with appropriate experience.

13 Precautions

13.1 Vapours from components of the system may cause irritation to the respiratory system, eyes and skin. The system should be used only in areas with sufficient ventilation to prevent the build-up of vapours. Contact with the skin, eyes and clothes must be avoided. The manufacturer's material safety data sheets must be consulted for detailed information on the safe handling and use of the products.

13.2 Components must not be allowed to get into the waste drainage system.

14 Maintenance and repair

Maintenance

14.1 Roofs should be inspected annually in autumn after leaf fall and in the spring to ensure vegetation and other debris are cleared from the roof and drainage outlets cleared.

14.2 Washing of the membrane may be carried out using a mild detergent, water and soft brush. Strong alkali solutions, eg caustic soda or bleach, must not be used.

14.3 In the event that the system is contaminated by chemicals, oils and greases then the advice of the Certificate holder should be sought.

Repair

14.4 Any damage to the system must be repaired as soon as possible to ensure that the integrity of the waterproofing is maintained using one of the following two methods.

Method 1 – Overlapped repair

14.5 The damaged waterproofing membrane is cut back to bonded material. The exposed substrate and adjacent bonded waterproofing (at least 100 mm) is cleaned and the existing Kemperol 2K-PUR lightly abraded and wiped with Kemperol MEK cleaner.

14.6 The substrate is primed using the correct compatible primer and the Kemperol 2K-PUR reinstated with the correct fleece grade, ensuring a minimum 50 mm overlap with the existing membrane.

Method 2 – Hidden repair

14.7 The damaged waterproofing membrane is cut back to bonded material. The exposed substrate and adjacent bonded waterproofing (at least 100 mm) is cleaned and the existing Kemperol 2K-PUR lightly abraded and wiped with Kemperol MEK cleaner.

14.8 The correct grade of fleece reinforcement is laid over the repair area and the shape of the repair traced and the fleece cut to ensure it butts with the existing sound material.

14.9 The substrate is primed using the correct compatible primer and the system reinstated ensuring a butt-joint with the existing membrane.

14.10 Kemperol Reinforcement Strip is immediately laid over the butt-joint in the repair ensuring that the strip is fully saturated with the Kemperol 2K-PUR waterproofing resin.

15 Durability



Kemperol 2K-PUR has been used in Germany since 1998 and early installations continue to perform satisfactorily. Accelerated weathering tests confirm the satisfactory retention of physical properties and indicate that, with adequate maintenance and repair, the system should have a service life of up to 25 years.

Installation

16 General

16.1 The Kemperol 2K-PUR Roof Waterproofing System must be applied in accordance with the manufacturer's instructions. Work must not be carried out if rain is imminent; the ambient temperature at the time of laying must lie between 5°C and 35°C and the relative humidity should be below 85%.

16.2 The temperature of the substrate should be at least 3°C above the dew-point.

16.3 If ambient temperatures are below 10°C, Kemperol 2K-PUR accelerator should be added at the rate of 40 g or 80 g for a 5 kg or 12.5 kg pack of Kemperol 2K-PUR resin respectively. The accelerator must be added to component A and mixed until streaks are not visible.

16.4 Substrates to which the system is to be applied must be dry (residual moisture content of less than 5% in the upper 20 mm), clean and free from loose particles, paint, grease and oil or other contaminants which may affect the adhesion.

16.5 Defects in the substrate, eg cracks, should be suitably repaired prior to application, in accordance with the manufacturer's instructions. The system can bridge cracks up to 2 mm wide.

16.6 The substrate should be primed with the appropriate primer in accordance with the manufacturer's instructions and Table 3 of this Certificate.

16.7 All tools and spraying equipment should be cleaned after use with Kemperol MEK cleaning solvent.

17 Application

17.1 The 2K-PUR resin must be mixed in accordance with the manufacturer's instructions to ensure a homogeneous material.

17.2 The 2.5 kg foil packed material incorporates both components separated from each other by a rubber cord. The material is mixed by thoroughly kneading component A. The rubber cord is removed and the foil sachet kneaded together quickly for at least one minute or until a streak-free homogeneous mixture is obtained.

17.3 Materials packaged in tins should be thoroughly stirred. Component B is decanted into component A and thoroughly mixed until streaks are not visible (using slow-speed drill). The mixture is transferred into another clean container and stirred again for approximately one minute.

17.4 Prior to application to the main roof area, any protrusions and upstands must be treated with the fleece saturated with mixed 2K-PUR in accordance with the Certificate holder's instructions for standard details.

17.5 Approximately two-thirds of the mixed pack is applied to the substrate at a minimum coverage rate of 2 kgm⁻². The Kemperol Fleece 165 is rolled into the wet resin and worked with a Perlon roller, removing any air bubbles. The remaining resin is immediately applied to the treated surface, wet-on-wet, until complete saturation is achieved. The minimum total coverage rate for the 2K-PUR resin application will be 3 kgm⁻². The minimum coating thickness should be 2 mm.

17.6 Exposed applications to balconies, terraces and podiums subject to pedestrian traffic should be protected with traditional finishes (see section 7.5).

Technical Investigations

The following is a summary of the technical investigations carried out on the Kemperol 2K-PUR Roof Waterproofing System.

18 Tests

18.1 The results of characterisation and performance tests carried out by the German Polymer Institute leading to the issue of European Technical Approval ETA-03/0044 issued by the Deutsches Institut für Bautechnik (DIBt) are summarised in Tables 4 and 5 respectively.

Table 4 Characterisation tests

| Test (units) | Method ⁽¹⁾ | Mean result |
|--|-----------------------------------|-------------|
| Viscosity (mPa s) | DIN EN ISO 3219 ⁽²⁾ | |
| Kemperol 2K-PUR | | |
| Component A | | 2850 |
| Component B | | 26 |
| Density (g cm ⁻³) | DIN 53217-3 | |
| Kemperol 2K-PUR | | |
| Component A | | 1.210 |
| Component B | | 1.213 |
| Ash content (% mass) | DIN 53568-1 EN ISO 3451-1 | 21.4 |
| Non-volatile content (% mass) | DIN EN ISO 3251 | 99.0 |
| Tensile strength/elongation (Nmm ⁻² /%) | EN ISO 527-1 and 4 ⁽³⁾ | |
| – control | | 9.8/32.4 |
| – after heat ageing ⁽⁴⁾ | | 11.6/27.4 |
| – after UV ageing ⁽⁵⁾ | | 10.4/28.9 |

(1) The test methods are detailed in the *Bibliography*.

(2) Cone and plate measuring system.

(3) Specimen type 1B, test speed 200 mm min⁻¹, test temperature 23°C.

(4) Heat aged at 80°C for 200 days.

(5) 1000 MJ m⁻² total radiant exposure, fluorescent lamps, 60°C, 1 h spraying and 5 h dry.

Table 5 Performance tests

| Test (units) | Method ⁽¹⁾ | Mean result |
|---|--------------------------------------|-------------------------------|
| Water vapour permeability (μ) | DIN EN 495-4 | 3.100 ⁽²⁾ |
| Water vapour permeability ($\text{gm}^{-2} \text{day}^{-1}$) ⁽³⁾ | BS 3177 | 0.61 |
| Watertightness | 24 h exposure to 1 m head of water | Watertight |
| Tensile bond strength Nmm^{-2} concrete substrate | EOTA TR 004 | |
| – control | | 1.6 (50% adhesion failure) |
| – exposure to surface water ⁽⁴⁾ | | 2.1 (mainly adhesive failure) |
| – day joints | | 1.9 (mainly concrete failure) |
| Resistance to fatigue ⁽⁵⁾ | | |
| – control | 1000 cycles ⁽⁶⁾ | Watertight |
| – after heat ageing ⁽⁷⁾ | 50 cycles ⁽⁶⁾ | Watertight |
| Resistance to extreme low temperatures (-30°C) | EOTA TR 013 | Satisfactory |
| Resistance to dynamic impact | Generally to EOTA TR 006 | |
| control on hard substrate | | I_4 |
| control on soft substrate | | I_2 |
| -20°C on hard substrate | | I_4 |
| -20°C on hard substrate after heat ageing ⁽⁷⁾ | | I_4 |
| -10°C on hard substrate after UV ageing ⁽⁸⁾ | | I_4 |
| Resistance to static indentation | Generally to EOTA TR 007 | |
| control on hard substrate | | L_4 |
| control on soft substrate | | L_2 |
| 90°C on hard substrate | | L_4 |
| 80°C on hard substrate after exposure to surface water ⁽⁴⁾ | | L_4 |
| Resistance to roots | Generally to DIN 4062 ⁽⁹⁾ | No penetration |

(1) The test methods are detailed in the *Bibliography*.

(2) Membrane thickness 3.124 mm.

(3) Tests carried out by the BBA at 25°C and 75% RH (temperate conditions).

(4) Exposure to surface water at 60°C for 180 days.

(5) Tested at -10°C .

(6) Cycled ± 1 mm from an initial gap of 1 mm.

(7) Heat aged at 80°C for 200 days.

(8) 1000 MJ m^{-2} total radiant exposure, fluorescent lamps, 60°C , 1 h spraying and 5 h dry.

(9) Sub-clause 4.7, test duration 6 weeks, 2 mm to 3 mm thickness.

18.2 The results of performance tests carried out by the BBA are summarised in Table 6.

Table 6 Performance tests carried out by the BBA

| Test (units) | Method ⁽¹⁾ | Mean result |
|--|-----------------------|-----------------------------------|
| Tensile bond strength (Nmm ⁻²) | EOTA TR 004 | |
| mastic asphalt | | |
| (Kemperol primer D) | | |
| – control | | 0.91 (adhesion failure) |
| – exposure to surface water ⁽²⁾ | | 0.79 (adhesion/substrate failure) |
| Mastic asphalt | | |
| (Kemperol primer AC) | | |
| – control | | 1.15 (adhesion failure) |
| – exposure to surface water ⁽²⁾ | | 1.02 (adhesion failure) |
| Plywood | | |
| (Kemperol primer D) | | |
| – control | | 0.74 (substrate failure) |
| – exposure to surface water ⁽²⁾ | | 0.81 (substrate failure) |
| Steel | | |
| (Kemperol primer D) | | |
| – control | | 1.16 (adhesion failure) |
| – exposure to surface water ⁽²⁾ | | 1.06 (adhesion failure) |
| Glass-faced PU insulation | | |
| (Kemperol primer D) | | |
| – control | | 0.10 (substrate failure) |
| – exposure to surface water ⁽²⁾ | | 0.09 (substrate failure) |
| GRP | | |
| (Kemperol primer D) | | |
| – control | | 0.79 (adhesion failure) |
| – exposure to surface water ⁽²⁾ | | 0.98 (adhesion/substrate failure) |
| PVC membrane | | |
| (Kemperol primer D) | | |
| – control | | >0.11 ⁽³⁾ |
| – exposure to surface water ⁽²⁾ | | >0.13 ⁽³⁾ |
| Resistance to wear | Generally to BS 784 | |
| (2K-PUR + Kemperol Topcoat/ Kemperdur quartz wear course) | | |
| total weight loss (g) | | 12.5 ⁽⁴⁾ |
| mean weight loss rate (g h ⁻¹) | | 2.1 ⁽⁴⁾ |
| Slip resistance (coefficient) | BBA T1/10 | |
| before abrasion | | |
| – dry | | 0.98 |
| – wet | | 0.95 |
| after abrasion ⁽⁵⁾ | | |
| – dry | | 0.85 |
| – wet | | 0.76 |

(1) The test methods are detailed in the *Bibliography*.

(2) Exposure to surface water at 60°C for 60 days.

(3) PVC membrane de-bonded from test plates.

(4) Specimen surface area (100 x 150) mm.

(5) Generally to BS 784.

19 Investigations

19.1 An assessment was made of independent fire test reports relating to the system's performance in respect of spread of flame and fire penetration to BS 476-3 : 1958.

19.2 Visits were made to existing sites in Germany to assess the system's in-service performance.

19.3 The manufacture and production control procedures at the manufacturing location in Germany were assessed.

Bibliography

BS 476-3 : 1958 *Fire tests on building materials and structures — External fire exposure roof test*

BS 784 : 1973 *Methods of test for chemical stoneware*

BS 3177 : 1959 *Method for determining the permeability to water vapour of flexible sheet materials used for packaging*

BS 8217 : 2005 *Reinforced bitumen membranes for roofing — Code of practice*

BS 8218 : 1998 *Code of practice for mastic asphalt roofing*

DIN 4062 : 1978 *Cold processable plastic jointing materials for sewer drains; jointing materials for prefabricated parts of concrete, requirements, testing and processing*

DIN 53217-3 : 1991 *Determination of density of paints, varnishes and similar coating materials by the displacement float method*

DIN 53568-1 : 1974 *Testing of plastics, rubber and elastomers; Determination of residue on ignition without chemical pre-treatment of the sample*

DIN EN 495-4 : 1991 *Thermoplastic and elastomeric roofing and sealing sheets; Determination of water vapour transmission properties*

DIN EN ISO 3219 : 1994 *Plastics — Polymers/resins in the liquid state or as emulsions or dispersions — determination of viscosity using a rotational viscometer with defined shear rate*

DIN EN ISO 3251 : 2003 *Paints, varnishes and plastics — Determination of non-volatile matter content*

EN ISO 527-1 : 1996 *Plastics — Determination of tensile properties — general principles*

EN ISO 527-4 : 1997 *Plastics — Determination of tensile properties — test conditions for isotropic and orthotropic fibre-reinforced plastic composites*

EN ISO 3451-1 : 2002 *Plastics — Determination of Ash — Poly(vinyl chloride)*

EOTA Technical Report TR 004 (August 1998), *Liquid Applied Roof Waterproofing Kits (LARWK) — Determination of the resistance to dynamic indentation*

EOTA Technical Report TR 006 (May 1999), *Liquid Applied Roof Waterproofing Kits (LARWK) — Determination of the resistance to dynamic indentation*

EOTA Technical Report TR 007 (May 1999), *Liquid Applied Roof Waterproofing Kits (LARWK) — Determination of the resistance to static indentation*

EOTA Technical Report TR 013 (May 1999), *Liquid Applied Roof Waterproofing Kits (LARWK) — Determination of crack bridging capability*

Conditions of Certification

20 Conditions

20.1 This Certificate:

- relates only to the product/system that is named and described on the front page
- is granted only to the company, firm or person named on the front page — no other company, firm or person may hold or claim any entitlement to this Certificate
- is valid only within the UK
- has to be read, considered and used as a whole document — it may be misleading and will be incomplete to be selective
- is copyright of the BBA
- is subject to English law.

20.2 References in this Certificate to any Act of Parliament, Regulation made thereunder, Directive or Regulation of the European Union, Statutory Instrument, Code of Practice, British Standard, manufacturers' instructions or similar publication, are references to such publication in the form in which it was current at the date of this Certificate.

20.3 This Certificate will remain valid for an unlimited period provided that the product/system and the manufacture and/or fabrication including all related and relevant processes thereof:

- are maintained at or above the levels which have been assessed and found to be satisfactory by the BBA
- continue to be checked as and when deemed appropriate by the BBA under arrangements that it will determine
- are reviewed by the BBA as and when it considers appropriate.

20.4 In granting this Certificate, the BBA is not responsible for:

- the presence or absence of any patent, intellectual property or similar rights subsisting in the product/system or any other product/system
- the right of the Certificate holder to manufacture, supply, install, maintain or market the product/system
- individual installations of the product or system, including the nature, design, methods and workmanship of or related to the installation
- the actual works in which the product/system is installed, used and maintained, including the nature, design, methods and workmanship of such works.

20.5 Any information relating to the manufacture, supply, installation, use and maintenance of this product/system which is contained or referred to in this Certificate is the minimum required to be met when the product/system is manufactured, supplied, installed, used and maintained. It does not purport in any way to restate the requirements of the Health & Safety at Work etc Act 1974, or of any other statutory, common law or other duty which may exist at the date of this Certificate or in the future; nor is conformity with such information to be taken as satisfying the requirements of the 1974 Act or of any present or future statutory, common law or other duty of care. In granting this Certificate, the BBA does not accept responsibility to any person or body for any loss or damage, including personal injury, arising as a direct or indirect result of the manufacture, supply, installation, use and maintenance of this product/system.



In the opinion of the British Board of Agrément, the Kemperol 2K-PUR Roof Waterproofing System is fit for its intended use provided it is installed, used and maintained as set out in this Certificate. Certificate No 06/4388 is accordingly awarded to Kemper System Ltd.

On behalf of the British Board of Agrément

Date of issue: 27th November 2006

Chief Executive

Electronic Copy

British Board of Agrément

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For technical or additional information,
contact the Certificate holder (see
front page).
For information about the Agrément
Certificate, including validity and
scope, tel: Hotline 01923 665400,
or check the BBA website.