

IMO, 4 Albert Embankment, SE1 7SR



Prepared for:	Faithful & Gould
Contact:	Simon Guild
Address:	Euston Tower 286 Euston Rd Kings Cross London NW1 3AT
Tel:	020 7121 2121 / 0791 717 3206
Email:	Simon.Guild@fgould.com
Project:	IMO Plantroom Re-waterproofing Project
Project Address:	4 Albert Embankment London SE1 7SR

Prepared by:	Spencer Sawyer
Job Title:	Regional Sales Manager - South East
Tel:	07843 286248
Email:	spencersawyer@kempersystem.co.uk
Date:	23 June 2016

Contents		Page No.
1.	Project Overview	4
2.	System Components	4
3.	General Preparation	4
4.	Detail Preparation	5
5.	Substrate Preparation	6
6.	Primer.....	6
7.	Waterproofing.....	7
8.	Surfacing/Protection.....	8
9.	Specific Detail/Standard Details.....	8
10.	General Instructions	9
11.	Completion	9
12.	Approved Contractors	10
13.	Photographic Record.....	11
14.	Appendix.....	15
A.	Company Profile	15
B.	Environmental Policy.....	15
C.	Sustainable, Renewable, Solvent-Free Liquid Waterproofing	15
D.	Technical Support.....	16
E.	Health and Safety Guidance	16
F.	Certification	16
15.	The Small Print.....	17

1. Project Overview

KEMPER SYSTEM were invited by Simon Guild of Faithful & Gould to view the plant room floor at IMO, 4 Albert Embankment and recommend a suitable waterproofing system to overlay the existing painted bituminous substrate.

Based on our findings, we are pleased to confirm that the existing substrate is suitable for direct overlay with our fully bonded, reinforced cold applied KEMPEROL® 2K-PUR solvent free and odourless waterproofing system.

The BBA/ETA certified KEMPEROL® 2K-PUR waterproofing system consists of a polyurethane based resin saturated into a non-woven polyester fleece for strength and is suitable for bonding directly to a bituminous substrate.

This system has many advantages over traditional bitumen based roofing materials, including:-

- Cold applied, no requirement for hot works during the installation.
- There is no need to remove extensive areas of the existing roof coverings, minimising the risk of water ingress during the works and possible disruption to the buildings occupants.
- The membrane is not thermoplastic, and therefore will not soften and slump when warm and is permanently flexible even at low temperatures.
- Standing water has no detrimental effect on the membrane.
- KEMPEROL® 2K-PUR is both odour and solvent free.
- The system provides a fully encapsulated, seamless waterproofing solution.

The following specification is to be covered by the KEMPER SYSTEM waterproofing materials warranty for a period of 15 years from the date of practical completion. In order to meet this requirement only KEMPEROL® approved roofing contractors may be used. The eligibility of proposed roofing contractors should be confirmed with KEMPER SYSTEM.

Note: The new system will follow the profile of the existing roof structure and any deviations will be replicated; as a result, some areas of standing water may occur; please note this will not have any adverse effect on either the waterproofing integrity or life expectancy of the KEMPEROL® products specified. Independent BBA certification confirms that KEMPEROL® 2K-PUR is suitable for zero pitch application. If ponding is undesirable allowances should be made to improve the falls or introduce additional drainage.

2. System Components

KEMPERTEC® EP5 Primer	Two component solvent free primer based on epoxy resins designed to condition surfaces prior to the application of KEMPEROL® waterproofing.
KEMPERTEC® KR Quartz	Used as a trowel applied repair or levelling mortar in combination with either KEMPERTEC® EP or EP5 Primer.
KEMPEROL® 2K-PUR	Two component, fully reinforced cold liquid applied solvent-free waterproofing system based on polyurethane resin that forms a permanently elastic, seamless, fully bonded membrane.
KEMPEROL® 165 Fleece	A reinforcement for KEMPEROL® waterproofing with the additional benefit of regulating waterproofing layer thickness.
KEMPEROL® Corner Circles	Pre-cut KEMPEROL® fleece to be used on all internal and external corners.
KEMPEROL® MEK Cleaning Agent	A strong cleaning agent used to clean and/or remove surface contaminants from the substrate prior to the application of the waterproofing membrane.

3. General Preparation

The following represents the minimum preparation that should be expected. All substrates should be re-assessed as work progresses and measures taken to ensure that all surfaces to receive KEMPEROL® waterproofing are correctly prepared as per KEMPER SYSTEM guidelines and recommendations. This may include core samples and any additional investigation to ensure that all substrates will provide a stable and continuous surface for the expected life of the newly installed waterproofing system. All observations and subsequent operations should be methodical to avoid any missed items. No claims arising from failure to do so will be considered by KEMPER SYSTEM.

Before applying coatings ensure that the surfaces are firmly fixed, dry and smooth and free from any loose, weathered materials or contaminants that could inhibit adhesion. Generally, when cleaning, sweep and shovel away bulk of contamination then clean any remaining contamination by suitable means e.g. power washing, grit blasting or mechanical abrading. Use approved detergents for more effective washing and to remove oil and grease. Organic growth can be treated using an approved fungicidal wash. For cleaning or degreasing small areas use KEMPEROL® MEK Universal Cleaner where appropriate to do so. Fill any large voids and remove sharp aggregate or protrusions and abrade at perimeter (100mm wide) details where enhanced adhesion (provide a mechanical key).

Ensure satisfactory completion of all preliminary work including formation of upstands, kerbs, box gutters, sumps, grooves, chases, expansion joints, and fixing of battens, fillets, anchoring plugs/strips, etc. For a given substrate, only use the primer recommended by KEMPER SYSTEM.

When cleaning, sweep and shovel away bulk of contamination then clean any remaining contamination by suitable means e.g. power washing or mechanical abrading to metal substrates. Thorough cleaning should be carried out using KEMPERTEC® concentrate cleaner at 5% minimum dilution (stronger where required) followed by thoroughly rinsing with clean water to ensure complete removal of any surface contamination.

All surfaces to receive KEMPEROL® waterproofing require priming with the appropriate KEMPERTEC® primer to seal and condition the substrate to achieve maximum adhesion of the KEMPEROL® waterproofing.

Carry out adhesion tests on all substrates immediately upon appointment of works, to ensure satisfactory adhesion is obtained. The surface tensile strength of the surface can be determined by the pull-off method as given in BS EN 13892-8 to a minimum of 1.5N/mm², prior to the commencement of coating works.

4. Detail Preparation

Voids/cracks:	Any voids / cracks to substrate should be ground out and cleaned, then filled level prior to the application of the waterproofing. Please refer to the clause on repair mortar for further guidance.
Existing upstands:	To be checked for security and if necessary cut these away, prepare to allow suitable termination of the KEMPEROL®.
Outlets:	To be cleaned, wire brushed and degreased with KEMPEROL® MEK cleaning agent before priming with the appropriate KEMPERTEC® primer. Consideration should be given to installing either new or refurbishment type outlets.
Stanchions:	To be cleaned, wire brushed and degreased with KEMPEROL® MEK cleaning agent before priming with the appropriate KEMPERTEC® primer.
Plant/machinery:	Temporarily raise any plant/machinery that will hinder the successful application of the KEMPEROL® waterproofing system giving due consideration to the plants use. Where this cannot be temporarily switched off obtain specific product guidance and qualified assistance as to correct methodology and procedure.
Inaccessible plant:	To be boxed in to create a new upstand detail around the plant using either 18mm minimum exterior grade plywood (to BS EN 635 Parts 2 and 3) or appropriate thickness cementitious board. Area to be confirmed with the client.
Accessible plant:	Where plant cannot be raised and the supporting frame work creates an isolated area where water would not be able to escape from, these areas are to be infilled using either an appropriate thickness of WBP ply or a suitable repair/infill product.
Cable trays:	Temporarily raise any cable trays that will hinder the successful application of the KEMPEROL® waterproofing system.

Steel angles and bolts: To be cleaned, wire brushed and degreased with KEMPEROL® MEK cleaning agent before priming with the appropriate KEMPERTEC® primer.

Adjacent surfaces: All surfaces not receiving the KEMPEROL® waterproofing system to be suitably protected to prevent accidental coating.

5. Substrate Preparation

Painted bituminous substrate: All loose paint to be removed from substrate. Mechanically abrade and thoroughly clean to ensure that all debris, loose paint and other contaminants that may inhibit adhesion are removed.

Carry out small preparation area and test to check if adhesion is adequate before preparing the whole area. Use a proprietary degreaser or where appropriate, KEMPEROL® MEK universal cleaner to degrease the surface.

Ensure the surface is dry and free from contamination before priming.

Repair Mortar

KEMPERTEC® EP5-Primer (2-20mm) - Two component solvent free with graded fillers.

Before application of the repair mortar, KEMPERTEC® EP5-Primer should be applied to the substrate.

Mixing: Mix parts A and B to an even consistency, transfer to a new container and again mix. Slowly add the KEMPERTEC® KR Quartz. Use a mechanical stirrer to produce a uniform mix.

Application: Apply to the prepared and primed substrate to fill cracks and voids of up to 20 mm in depth. KEMPEROL® waterproofing can be applied once the mortar mix is tack-free.

Application conditions: Application should only take place when the air temperature is +10/+5°C (EP/EP5) or greater and the substrate is +3°C (and rising) above the dew point.

Mixing Ratio EP/EP5	Working Time (23°C) EP/EP5	Rain-Resistant after:	Ready for foot traffic after: EP/EP5	Ready for further coatings after: EP/EP5	Maximum overcoating time:
1:9/1:5 (by weight)	20 min	3 hrs	N/A	4 hrs	*

N.B. Quoted working and drying times are based on ambient conditions of 23°C/50% relative humidity but are temperature dependant.

* Adhesion tests should be carried out prior to waterproofing if left for extended periods of time.

6. Primer

KEMPERTEC® EP5-Primer - Two component solvent free epoxy primer

Mixing: Mix parts A and B to an even consistency, transfer to a new container and again mix.

Application: Inspect the surface to be coated to ensure it is dry and free from contamination. Apply by brush or nylon roller (with a rubber blade if necessary) to seal and condition the substrate. Do not interrupt the work until the substrate has been fully saturated with the primer. Avoid accumulations of material.

Immediately over-scatter with KEMPERDUR® NQ0712 kiln-dried quartz at a coverage rate of 2kg/m².

Application conditions: Application should only take place when the air temperature is +10/+5°C (EP/EP5) or greater and the substrate is +3°C (and rising) above the dew point.

Typical coverage	Working Time (23°C) EP/EP5	Rain-Resistant after:	Ready for foot traffic after: EP/EP5	Ready for further coatings after: EP/EP5	Maximum overcoating time:
0.5kg/m ² *	20 min	6 hrs	4 hrs	4 hrs	**

N.B. Quoted working and drying times are based on ambient conditions of 23°C/50% relative humidity but are temperature dependant.

* Will vary depending upon substrate porosity and profile.

** Adhesion tests should be carried out prior to waterproofing if left for extended periods of time.

7. Waterproofing

KEMPEROL® 2K-PUR/165 - Two component reinforced cold applied solvent free waterproofing system based on polyurethane resin

Mixing - Sachets: Knead contents of sachet then pull away the rubber separating cord so that both components can be mixed together. Knead the bag quickly and thoroughly for approximately 60 seconds so that a streak free homogenous mixture is formed. Pour into another container and stir again.

Mixing - Containers: Add component B (hardener) to component A. Scrape out the hardener container until it is completely empty. Mix with a mixing paddle until there are no bubbles or streaks. To avoid mixing errors, transfer to a different container and mix again with a slowly rotating mixer for approximately 1 minute.

Application: Approximately 2/3 of the required KEMPEROL® resin should be applied to the primed substrate prior to embedding the KEMPEROL® fleece. Roll out the KEMPEROL® fleece directly into the liquid KEMPEROL® waterproofing system ensuring there are no folds, creases or air bubbles, allowing for 50mm on fleece overlaps. Use a roller or brush to remove any air bubbles and then apply the remaining approximate 1/3 of the KEMPEROL® waterproofing resin while the first coat is still wet until the fleece is fully saturated. Avoid accumulations of material.

All overlaps in the fleece should be fully saturated to ensure continuity of the system, and be a minimum of 50mm. Connections to the surface waterproofing should be made with a minimum 100mm overlap.

Application conditions: Application should only take place when the air temperature is +5°C or greater and the substrate is +3°C (and rising) above the dew point.

At temperatures of less than 10°C, mix KEMPEROL® 2K-PUR Speedshot into component A of the KEMPEROL® 2K-PUR Waterproofing resin. Stir well with a stirring stick or low speed paddle mixer until there are no streaks in the mixture. Mixing time – approximately 1 minute.

Typical coverage	Working Time (23°C)	Rain-Resistant after:	Ready for foot traffic after:	Ready for further coatings after:	Maximum overcoating time:
3kg/m ²	30 min	2 hrs	16 hrs	3 days	8 days

N.B. Quoted working and drying times are based on ambient conditions of 23°C/50% relative humidity but are temperature dependant.

8. Surfacing/Protection

Alkalinity Protection/Bonding Layer

KEMPERTEC® EP/EP5-Primer - Two component solvent free epoxy primer.

Mixing: Mix parts A and B to an even consistency, transfer to a new container and again mix.

Application: Apply by brush or nylon roller to seal and condition the substrate. Avoid accumulations of material.

Immediately over-scrub with KEMPERDUR NQ 0712 at a coverage rate of 0.5-1.0kg/m² ensuring full coverage.

Application conditions: Application should only take place when the air temperature is +10/+5°C (EP/EP5) or greater and the substrate is +3°C (and rising) above the dew point.

Typical coverage	Working Time (23°C) EP/EP5	Rain-Resistant after:	Ready for foot traffic after: EP/EP5	Ready for further coatings after: EP/EP5	Maximum overcoating time:
0.5kg/m ² *	25/20 min	6 hrs	16/4 hrs	16/4 hrs	3 days**

N.B. Quoted working and drying times are based on ambient conditions of 23°C/50% relative humidity but are temperature dependant.

* Will vary depending upon substrate porosity and profile.

** When covering with a screed or product containing cementitious material.

Traditional Protective Finish: Interlocking rubber mats with pre-formed drainage channels.

Manufacturer: To project specification

Product reference: To project specification

Preparation: Protect waterproofing during subsequent works.

9. Specific Detail/Standard Details

All upstands, down-stands, drip edges, terminations and other details should be as KEMPER SYSTEM guidelines, technical information and in accordance with project specific drawings, appropriate legislation and good working practice.

Generally: Where possible all detail works should be waterproofed first followed by any remaining field areas.

Corners: Pre-cut KEMPEROL® fleece to be used on all internal and external corners.

Skirtings/upstands: Waterproofing upstands to be 150mm minimum high.

Outlets: KEMPEROL® resin to be dressed into the primed outlets. $\frac{2}{3}$ of the mixed resin is applied directly to the outlet, KEMPEROL® reinforcement fleece is embedded and saturated. The final $\frac{1}{3}$ of the mixed resin is then applied whilst the first application is still wet, ensuring removal of any air pockets. The KEMPEROL® waterproofing should lap onto the primed outlet 150mm and any fleece on fleece laps to be 50mm minimum.

Stanchions: To be formed using KEMPEROL® reinforcement fleece of the same specification as the main field area, cut to the correct size and shape to fully encapsulate the detail and lap onto the main roof area 50mm minimum. $\frac{2}{3}$ of the mixed resin is applied directly to the detail, KEMPEROL® reinforcement fleece is embedded and saturated. The final $\frac{1}{3}$ of the mixed resin is then applied whilst the first application is still wet, ensuring removal of any air pockets or bubbles. The KEMPEROL® waterproofing should lap onto the primed detail 150mm beyond any existing waterproofing and any fleece on fleece laps to be 50mm minimum.

- Plant/machinery:** If access below machinery/plant is restricted and they need to remain in use, slide a carrier membrane pre-treated with KEMPEROL® 2K-PUR incorporating KEMPEROL® 165 reinforcement fleece ensuring that there is a minimum of a 100mm edge on all sides to receive an overlapping of KEMPEROL® waterproofing membrane from the surrounding field area.
- Thresholds:** The new KEMPEROL® 2K-PUR waterproofing membrane is to be dressed up onto the thresholds and terminated using a termination bar.

10. General Instructions

Measures should be taken to ensure all works in progress are left watertight at the end of the working day.

All works to be carried out in accordance with all current Health and Safety legislation.

Allowance is to be made for protecting the works from damage due to inclement weather.

At all stages of installation, the KEMPEROL® waterproofing system should be protected from foot traffic and other sources of contamination or damage until the system is fully cured. Where required appropriate protection must be provided.

11. Completion

All outlets to be checked for blockages and cleared if necessary.

All arising from the works to be cleared from and disposed of appropriately.

Check coating surface when cured and repair any discontinuities.

All plant to be rested on supportive rubber matting to protect the new waterproofing membrane.

All cables and cable trays to be re-installed and secured without puncturing the new waterproofing membrane.

Storage, Disposal and Handling - Refer to the Material Safety Data Sheet for advice.

Install a notice/sign to the door of the plant room, identifying the contractor details, KEMPER SYSTEM details, the system installed and:

Any damage to the waterproofing membrane should be repaired as soon as possible to maintain the waterproofing integrity. In the first instance, the KEMPER SYSTEM approved contractor that installed the system should be contacted. All repairs to be carried out in accordance to BBA recommendations.

Seek advice from KEMPER SYSTEM should any alterations be required to the roof. If required, this work must be carried out by the KEMPER SYSTEM approved contractor who installed the original system. Ensure that the proposed alteration will not invalidate the KEMPER SYSTEM warranty.

Notify KEMPER SYSTEM and/or the KEMPER SYSTEM approved contractor who installed the original system should any other trades require fixing through or penetrating the waterproofing membrane. Any penetrations must be made good by the KEMPER SYSTEM approved contractor who installed the original system. Failure to do so may invalidate the KEMPER SYSTEM warranty.

In the event of un-foreseen spillage of chemicals, oils or greases please consult KEMPER SYSTEM, communicating the material involved, nature of contamination, and duration of exposure.

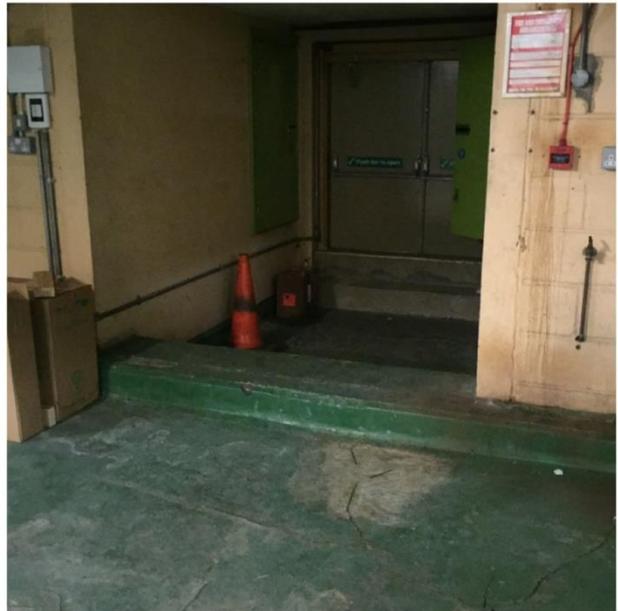
12. Approved Contractors

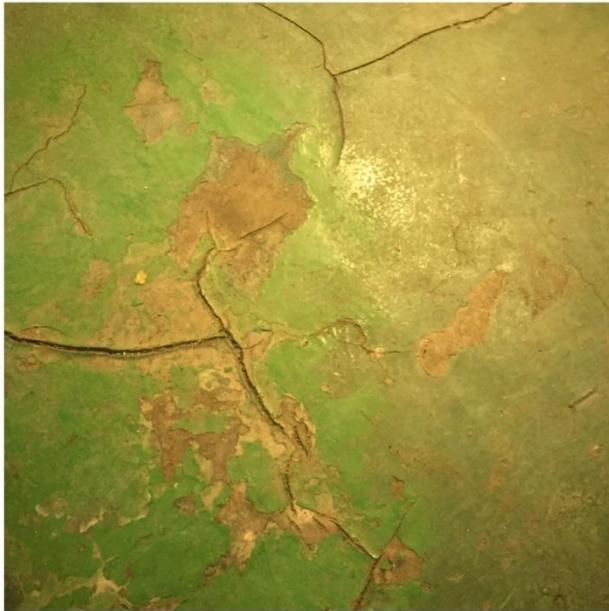
KEMPEROL® waterproofing systems should only be installed by operatives trained by KEMPER SYSTEM. It is the responsibility of the contractor/installer to ensure that the proposed specification complies with current building regulations and any relevant legislation. KEMPER SYSTEM are liable only for our products being free from faults and correct application of our products therefore falls entirely within the installers scope of liability and responsibility. Our products are sold exclusively on the basis of our conditions of sale and delivery.

Please see below a list of approved contractors for this project:

All Angles Roofing 32 Poveys Close Burgess Hill RH15 9TB	Contact: Email: Mobile:	Mike Baulu mikebaulu@yahoo.co.uk 07769 728182
AMG Waterproofing Ltd 23 Elm Drive Rayleigh Essex SS6 8AB	Contact: Email: Tel: Mobile:	Gary Millsom gary@amgwaterproofing.co.uk 01268 424598 07950 691715
BDM Ltd Whitecroft Honiley Avenue Wickford Essex SS12 9JE	Contact: Email: Tel: Mobile:	Ben Peters ben@bdmaintenance.co.uk 01268 720130 07788 197613
Cemplas Waterproofing & Concrete Repairs Ltd Holbrook House, 72 Lower Addiscombe Road Croydon, Surrey CR9 6AD	Contact: Email: Tel: Mobile:	Archie Gemmell Archie.gemmell@cemplas.co.uk 020 8654 3149 07526 003100
Mitie Tilley Roofing Ltd Unit B5, Chaucer Business Park Watery Lane Sevenoaks Kent TN15 6QY	Contact: Email: Tel: Mobile:	Chris Dimmick Chris.Dimmick@mitie.com 01732 762626 07387 232537

13. Photographic Record









14. Appendix

A. Company Profile

KEMPER SYSTEM is a specialist in liquid applied waterproofing and coating systems. Headquartered in the centre of Germany with international operating subsidiaries, our company provides waterproofing solutions globally from the most basic roof to the most challenging projects.

It was Dr Heinz Kemper who gave his name to the system when, in 1957, he set up a company for plastics and paints in Vellmar near Kassel in the heart of Germany. The development of waterproofing products began soon after in the 1960s, and has continued to this day.

The company maintains subsidiaries in the United Kingdom, France, Italy, Poland, the USA, Canada, Mexico, India and China, plus partnerships with qualified contractors and distributors in over 30 countries. KEMPER SYSTEM has evolved to become a worldwide specialist for waterproofing and coatings based on liquid-applied resin systems.

Waterproofing, surfacing, coating – whatever the project KEMPER SYSTEM offer dedicated solutions that are purpose-designed for the task. Working with specifiers and engineers we offer total support from design through to completion.

B. Environmental Policy

KEMPER SYSTEM is fully committed to the conservation of natural resources. For many years, the existing environmental management system in accordance with DIN ISO 14001 has been guaranteeing regulated environmental processes, providing an excellent framework for environmental protection. All our production sites operate a fully automated and fully closed process that keeps water and emissions to a minimum.

This includes:

- Optimum utilization of energy, water and raw materials.
- Prevention of environmental pollution from emissions, waste water, soil contamination and waste products.
- Adherence to environmental laws and regulations.
- Continuous improvement of technical and organisational measures for environmental protection and plant safety.
- Application of the best possible technologies whilst considering the economic significance and opportunities.
- Staff training to develop a sense of responsibility for the environment.
- Customer advice with regard to environmental-relevant topics and questions.
- Transparency due to public relations work at the production sites.

The effectiveness of the environmental policy is documented and analysed in the annual environmental management report. The implementation of environmental goals, audit results and data analysis ensure the continuous improvement and awareness of our environmental management system.

KEMPER SYSTEM has signed the chemical industry's unique global initiative 'Responsible Care'.

C. Sustainable, Renewable, Solvent-Free Liquid Waterproofing

KEMPEROL® 2K-PUR is a solvent-free waterproofing system applied in liquid form that needs all environmental and long-term performance requirements.

Roughly 80% of the applied polyols (resins) in KEMPEROL® 2K-PUR are obtained from the seeds of the tropical castor plant (*Ricinus Communis*) a renewable source. The polyester reinforcing fleece used in all our waterproofing systems contains up to 25% recycled materials.

Other products within our range such as KEMPERDUR® surfacing or KEMPEROL® primer, are also solvent-free allowing us to provide full solvent-free system solutions.

D. Technical Support

Technical support is crucial to the success of your projects. One of the most significant benefits of KEMPER SYSTEM is the expert technical advice of our staff. We provide a superior product as well as expert-in-house and field technical support personnel. For further guidance please contact 01925 445532.

E. Health and Safety Guidance

Where relevant, the following regulations and guidance must be complied with:

Health and Safety at Work Act 1974.
The Work at Heights Regulations 2005.
Construction (Design and Management) Regulations 2015.
Building Regulations: Part L – Conservation of fuel and power.
BS EN 13892-8:2002 Methods of test for screed materials. Determination of bond strength.
BS 6229:2003 Flat roofs with continuously supported coverings.
BS 5268-2:2002 Structural Use of Timber.
BS 5534:2014 Slating and tiling for pitched roofs and vertical cladding.

F. Certification

We develop and test new products in our own R&D laboratory. KEMPER SYSTEM complies with high quality standards. Compliance with those standards is monitored by our own QA staff and also independent institutes – test certificates, test reports and test marks are available for almost all our product; and are constantly updated or renewed.



15. The Small Print

Any variations from this specification to be agreed in writing by a member of the KEMPER SYSTEM technical department prior to being implemented on site. Failure to do so may invalidate the warranty.

This material specification is written to offer a waterproofing system that provides a solution to the client's needs. It is also to provide information on the correct application of KEMPEROL® waterproofing systems and to assist costing/pricing. It is written on the basis that all substrates and roof decks, and structures are sound and durable.

We cannot accept responsibility for the consequences of latent defects in the substrate, roof deck or structure. The technical information contained herein reflects the current level of knowledge and experience with our products, when stored, handled and applied under normal conditions.

KEMPEROL® waterproofing systems shall only be installed by operatives trained by KEMPER SYSTEM. It is the responsibility of the contractor/installer to ensure that the proposed specification complies with current building regulations and any relevant legislation. KEMPER SYSTEM are liable only for our products being free from faults and correct application of our products therefore falls entirely within the installers scope of liability and responsibility. Our products are sold exclusively on the basis of our conditions of sale and delivery (available on request).

Issue and Revision Record: (for internal use only)

Rev	Date	Originator	Checked	Description
-	27/03/2017	S Sawyer	V Ramwell	First issue
1	06/04/2017	S Sawyer	V Ramwell	Completion notes updated