

The purpose of this Note is to show which substrates are acceptable for the application of a Liquid Applied Waterproofing System LAWS, and which require special consideration prior to a LAWS treatment. Substrates are listed alphabetically for easy reference and any specialised items not listed should be referred to LRWA members for guidance.

Whilst the purpose of LAWS as outlined in this Guidance Note is primarily for roof waterproofing, this is not restrictive as the substrates may also be treated in non-roofing situations, eg Balconies and Walkways. Additionally LAWS may be used in a non-waterproofing aesthetic role as in redecoration, or in a dual decorative and waterproofing role. LAWS may also be considered as a maintenance coating, or used in a preventative role to avoid future substrate deterioration.

Other Guidance Notes in this series are available for further reference:

- Guidance Note No. 1 – ‘Roof, Balcony and Walkway Inspections for the Specification of Liquid Applied Waterproofing Systems’
- Guidance Note No. 3 - ‘Generic Types of Liquid Applied Waterproofing Systems for Roofs, Balconies and Walkways’
- Guidance Note No. 4 – ‘Roof, Balcony and Walkway Refurbishment using Liquid Applied Waterproofing Systems’
- Guidance Note No. 5 – ‘Health and Safety Provision for LAWS on Roofs, Balconies and Walkways’
- Guidance Note No. 6 – ‘Safe Use of Liquid Applied Waterproofing Systems’

1. Introduction

This Guidance Note describes the variety of existing substrate to which LAWS may be applied. A wide range of LAWS types exist and it is possible to find a suitable coating to apply in the vast majority of situations.

The most commonly encountered substrates are described together with cautionary notes. The type of preparation work and typical methods of application are referenced.

Health and Safety is paramount when considering any form of roofing work (eg working at height), Health and Safety is covered in detail in Guidance Note No. 5.

Based upon current best practice, the advice given in this Guidance Note is endorsed by the members of LRWA. It is important that this document is used in conjunction with other LRWA Guidance Notes and its Code of Practice.

LRWA acknowledges the participation of the representatives of the National Federation of Roofing Contractors and of the Flat Roofing Alliance in the preparation of this Note.

2. Substrates and Third Party Approvals

The best known and most widely recognised Third Party Approval for LAWS in the UK is the Agrément Certificate. As stated by the BBA (British Board of Agrément) “An Agrément Certificate is awarded to a product by the BBA only after it has successfully passed a comprehensive assessment involving laboratory testing, on-site evaluations and inspections on production, the latter to check that the manufacturer has a factory production control system in operation that will ensure the specification of the product will be maintained consistently.”

Compatibility of a LAWS on a particular substrate may be included as part of the overall assessment. Substrate preparation and priming requirements are detailed within the Agrément Certificate.

EUROPEAN - ETA

As a requirement of the Construction Products Directive (CPD) number 80/1 06/EC, European Technical Approvals (ETAs) have been developed for liquid applied waterproofing systems. An ETA is a Harmonised European Technical Specification as defined in the CPD, and as such is equivalent to a Harmonised European Standard.

The issue of an ETA for a particular system will demonstrate that the system satisfies the essential requirements of the CPD during an economically reasonable working life provided that:

- The system has been correctly installed.
- The conformity of the system with the ETA has been properly attested.

Note: There are very many different possible substrates to which LAWS may be applied. The fact that a particular substrate is not listed in an Agrément Certificate or ETA for a LAWS does not imply that the system may not be applied onto it. Individual manufacturers guidance must be sought on the compatibility of their LAWS with a substrate as well as the means of preparation, priming, and application onto that substrate.

3. Part L Building Regulations – Insulation

Prior to applying any LAWS, consideration must be given to whether or not the roof structure requires insulating to ensure that it complies with current Building Regulations.

If insulation is required, one consideration might be that it is fitted over the top of the existing substrate to create a warm roof, in which case either the insulation itself, or a carrier membrane, or a cover board becomes the new substrate.

Alternatively the original substrate may be waterproofed prior to fixing the insulation thereby creating an inverted roof. The third scenario is that the insulation is fitted internally in which case again it will be the original exposed substrate that will be waterproofed.

4. Substrates

The objective of all LAWS is primarily to waterproof and protect the substrate on which it is applied for the minimum period of time required by the client. The successful application and performance of the LAWS is largely dependent upon the suitability and preparation of the substrate. All specifiers of LAWS must ensure the suitability of the substrate for the chosen LAWS and prepare the surface in accordance with the LRWA Code of Practice and the recommendations of the LAWS supplier.

ACCEPTABLE SUBSTRATES FOR LAWS:

- Asbestos cement board
- Asphalt (untreated)
- Cement based: concrete, pre-formed or cast in situ, cement/sand screeds, dense and lightweight, eg perlite
- Reinforced Bitumen Membranes: smooth, sanded, polymer modified (APP, SBS), metal faced
- Fibre cement sheet (non-asbestos)
- Glass reinforced concrete (as panels and tiles)
- Glass reinforced polyester
- Insulation: this encompasses types that can be directly treated, those that are already covered and those that require pre-covering. Examples are: polyurethane or polyisocyanurate foam, either newly sprayed in place or as slabstock; polystyrene and phenolic board (some may have pre-bituminised surfaces), foamed glass, mineral wool, cork and cork composites, perlite, composite boards eg strawboard and miscellaneous fibrous types.
- Metal – flat or corrugated: comprising coated, galvanised or stainless steel, aluminium, copper, lead, zinc
- Pre-coated metal (not overpainted): coated with PVC Plastisol, PVDF, PVF2, polyester, silicone polyester, powder coatings (epoxy, acrylic, polyurethane), alkyd and alkyd hybrids
- Previously painted: this encompasses any of the substrates listed which have LAWS or solar reflective systems or general paint previously applied

- Polymeric single ply roofing membranes: made from plasticised PVC, EPDM, flexible Polyolefin (FPO) and other commonly used polymer membranes.
- Natural slates, tiles made from concrete or clay, manmade slate and stone, bitumen based and specialities.
- Roof lights: constructed from PVC, polycarbonate, acrylic, glass, GRP and other plastics.
- Wood: marine and external quality plywood, planked, shingles Not all systems are suitable for use on all substrates and it is essential that the advice given by manufacturers is closely followed.

Substrates – Important Notes

Substrates fall into 3 categories:

Those acceptable for direct treatment with LAWS

These are substrates which once correctly prepared provide a suitable base for direct applications. This preparation may include repair (eg refixing lifting felt), cleaning, drying, pre-treatments, biocidal washes, priming systems and specific treatments, for example joints, in advance of the main LAWS.

Those requiring extra consideration

These are substrates which require an investigation before the chosen system is confirmed. This can range from a visual inspection of any 'new' or poorly described substrates, through to core sampling to determine the composite deck structure if unknown; adhesion tests, moisture content determinations and determination as to suitability to accept a LAWS.

An example of this is the need to carry out adhesion tests to existing paints and solar reflective coatings, the latter can result in delamination unless further surface preparation or a suitable binding primer is used. Adhesion tests will also be required on "unidentified substrates". Some paints may themselves be poorly adhered and the different paint binders may require further surface preparation or selective primers or LAWS systems.

Similarly pre-coated metal, single ply membranes and roof lights will require identification and possible adhesion tests. Wet substrates may require the introduction of venting systems.

Careful consideration should be given to whether a coating may adversely affect a substrate. For example, some solvent based systems may not be applied directly onto bituminous substrates without a suitable isolating primer.

Those not suitable

There are some substrates that are not acceptable for direct treatment. These substrates will either need removing, or the overall application of insulation and/or a carrier membrane or cover board beforehand to provide a suitable base on which to apply the LAWS

Examples of these are:

- coal tar surfaces;
- insulation which is 'open' eg strawboard, or which may 'react' (via solvent) with LAWS, or be of deteriorated but other- wise sound quality;
- wooden substrates - multi jointed or moisture susceptible eg non-exterior grade plywood. The exception to this is where timber is part of the LAWS system. Chipboard should always be removed and replaced with a non-moisture sensitive deck.

Associated Constructions

Some of the substrates listed may also form extensions or associated items distinct from the main roof construction. These are acceptable for LAWS and include:

- upstands;
- parapets;
- drain throats
- balconies and walkways.

These items, eg upstands and parapets, may be of brick or other mineral construction. Miscellaneous items such as metal protrusions and mechanical fixings for boards are all included in LAWS treatments once suitably prepared, eg de-rusted, and primed.

Note: lightning conductors must not be coated, but lifted and then re-instated once the LAWS has been applied.

Gutters, Flashings and Trims

These are also part of the associated constructions but may require extra consideration, they are acceptable for inclusion in LAWS treatments.

Gutters

Gutter linings on flat roofs or balconies use materials that are the same as for the main areas as listed, but for pitched roofs the gutters may be external self supporting products of galvanised or mild steel, extruded PVC, extruded or rolled aluminium, cast iron, GRP or GRC. These may not require LAWS treatments.

Some internal gutters may not have a separate lining material, and may be fabricated from semi-structural self finished material such as galvanised or mild steel, cast iron or asbestos cement. These are usually included in LAWS treatments.

Flashings and Trims

Flashings are made from either hot or cold laid, flexible sheet materials such as lead, aluminium, copper. Zinc. They are normally lifted or removed and LAWS treatments taken below – they are then re-dressed.

Trims are generally of preformed or extruded aluminium or GRP and may be included in LAWS treatments as needed.

Preparation and Application Methods

Preparation is a detailed subject, and is subject to manufacturers requirements however each LRWA manufacturer adopts common principles, which include the need to remove all dirt, debris and water and ensure the suitability of the substrate for a LAWS. Preparation is covered briefly in Guidance Note No.1 and in the LRWA Code of Practice. Application methods are available from individual manufacturers who will advise on a per system basis. These may include brush, roller, spray and squeegee or a combination of these.

5. Health & Safety

This subject is expanded on in Guidance Note No. 5; an overview is also provided in Guidance Note No. 3. It is important to note the existence of and to satisfy the requirements of:

- The Construction (Design and Management) (CDM) Regulations
- Control of Substances Hazardous to Health (COSHH) Regulations
- Work at Height Regulations (WAHR)
- Control of Asbestos Regulations
- Manufacturers Chemicals (Hazard Information and Packaging for Supply (CHIP) Safety Data Sheets
- Speciality publications such as 'HSG/33 Health and Safety in Roofwork', HSE Publication 'Asbestos Essentials' and other related documents. ACR publications

LRWA members are committed to these principles and provide comprehensive information on the safe use of their respective LAWS. The LRWA Code of Practice also embodies these principles.

LRWA represents a group of manufacturers, applicators and raw material suppliers who are dedicated to best industry practice. Advice can be given, either centrally or from individual manufacturers, with the intention of supplying and applying systems to a client's full satisfaction. LRWA is involved in the preparation of European Technical Approvals, as the UK's official trade body, in conjunction with the BBA and EOTA. The Association produces a series of Guidance Notes, often in collaboration with the leading contractors' representative bodies, thus seek into reinforce the performance and quality potential of liquid roofing systems.

Whilst every effort has been made to ensure the accuracy of the information contained in this publication, it must be emphasised that the Association has itself not verified the information by independent testing: for this reason and because the Association has no control over the precise circumstances in which it will be used the Association, its officers, employees and members can accept no liability arising out of its use, whether by members of the Association or otherwise. The publication is of a technical nature only and makes no attempt to state or conform to building regulations or other legal requirements; compliance with these must be the individual user's own responsibility.