

Resin Bound Training Manual



Installing Resin Bound for the First Time?

We strongly recommend you take the time to learn about the materials, equipment and techniques involved in Resin Bound installation. Like most things, the final result depends on accuracy and attention to detail.

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**“What is Resin Bound? What Aggregates and Resin do I Use?
What does BBA Accreditation Mean?
What Kit do I Need? Where do I Start?
What about the Base? What Team do I Need?
What can Go Wrong?”**

We’ve been answering your questions for over 30 years!



As the manufacturer of DALTEX dried aggregates, Derbyshire Specialist Aggregates is the largest manufacturer of dried aggregates for Resin Bound and Resin Bonded systems in the UK.

We have been involved in the industry for over 30 years and we want to share all we know in order to help you create stunning Resin Bound installations for happy customers.

The DALTEX UVR Resin Bound System is BBA Accredited – this is currently the only industry standard available and the installation advice in this guide is designed to provide you with all the information you require to begin to install to BBA standards.

You will find more information and everything you need to complete an installation (including equipment) on our website: **resinbondedaggregates.com**

Of course, no two installations are the same so if you have any question about an installation – technical or sales related – **our experienced team of Resin Bound specialists can help on 01629 636500.**

We are justifiably proud of what we do and enjoy showing people around. If you’d like to visit our manufacturing site and see how we produce the cleanest, driest aggregate available, please give us a call or just drop in.

We wish you every success!

Sam Buckley
Managing Director –
Derbyshire Specialist Aggregates

What is Resin Bound?

Resin Bound is a system of laying a hard wearing course of mixed resin and dried aggregates onto either a new or existing macadam or concrete base.

Resin Bound is formed by mixing dried aggregates with a 2 part resin mixture. The mixture is trowelled and polished to give a uniform flat finish.





Resin Bound, the Fastest Growing Surfacing Solution in the UK

What makes Resin Bound so popular?

There are many hardsurfacing systems available on the market! From macadam to concrete to block paving and imprinted concrete – however nothing matches the performance and visual qualities of Resin Bound.

1. SUDS COMPLIANT

Urbanisation has led to an increased flooding risk and as a consequence all **new** driveways have to have comply with SUDS regulations. (Sustainable Urban Drainage Systems)

Resin Bound is SUDS compliant which means it does not require planning permission (providing the sub base on which it is laid is porous or a suitable soakaway exists). This can be a special concrete or open textured macadam on top of a type 3 stone. The system can also be laid directly on top of old macadam or concrete but will require a suitable soakaway or drainage flow. The existing surface must be sound and free of cracks.

It can handle up to 850 litres of water per m² per minute.

"You will not need planning permission if a new or replacement driveway of any size uses permeable (or porous) surfacing which allows water to drain through, such as gravel, permeable concrete block paving or porous macadam, or if the rainwater is directed to a lawn or border to drain naturally.

If the surface to be covered is more than five square metres planning permission will be needed for laying traditional, impermeable driveways that do not provide for the water to run to a permeable area".

UKGOV Planning Portal

2. APPEARANCE

Customers love Resin Bound's flat even appearance and its practicality.

3. DESIGN FLEXIBILITY

The system is so adaptable you can create any shape imaginable on the surface. Blends of colours and beading allow you to use two colours side by side, enabling superb design options.

4. STRENGTH

The Resin Bound aggregate system is strong and durable.

5. LOW MAINTENANCE

The surface is easy to clean if required and is weed resistant.



Benefits over other Surface Solutions

No other surfacing system can deliver ALL of the benefits of Resin Bound

| | Resin Bound | Macadam | Concrete | Block Paving | P.I.C. | Resin Bonded |
|-----------------|-------------|---------|----------|--------------|--------|--------------|
| Non Fade | ✓ | ✗ | ✗ | ✗ | ✗ | ✓ |
| Permeable | ✓ | ✗ | ✗ | ✗ | ✗ | ✗ |
| Slip Resistant | ✓ | ✗ | ✗ | ✗ | ✗ | ✓ |
| Weed Resistant | ✓ | ✗ | ✗ | ✗ | ✓ | ✓ |
| Frost Resistant | ✓ | ✗ | ✗ | ✗ | ✗ | ✗ |
| Seamless | ✓ | ✓ | ✗ | ✗ | ✗ | ✗ |

Resin Bound Plus Points

Permeable

Hard wearing

Slip resistant

Seamless

Easy to clean

Resistant to cracking

Weed resistant

Colour stable

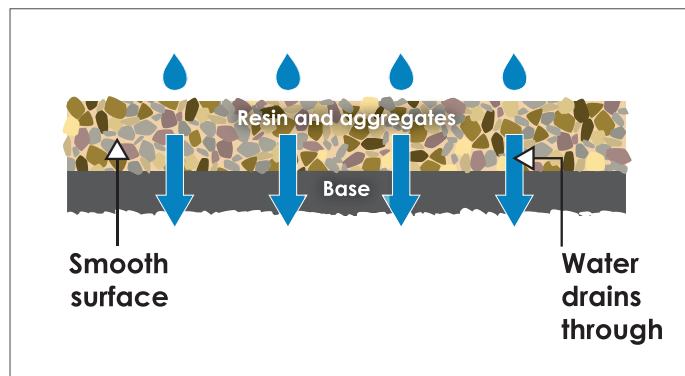
Oil spillage resistant

Frost resistant

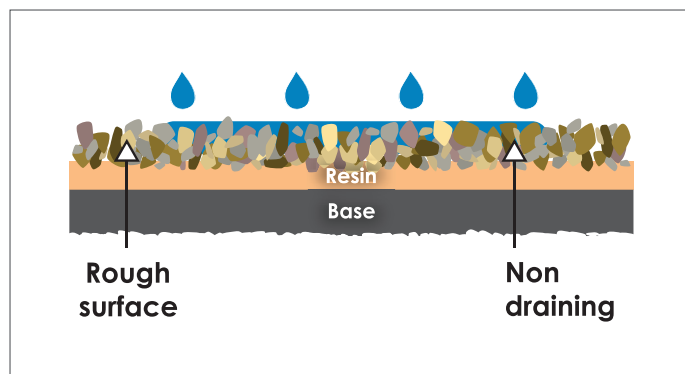
What's the Difference between Resin Bound and Resin Bonded?

You can tell the difference between Resin Bound and Resin Bonded on sight. The way they are installed and perform is very different.

Resin Bound combines resin with aggregate before laying and after trowelling, it produces a smooth even finish.



Resin Bonded has a textured finish and gives the appearance of loose gravel. This is achieved by spreading a layer of resin across the surface and then broadcasting aggregate into it. A primer is usually used, the resin is applied by a roller and the aggregate is broadcast onto the surface. Most of the aggregate sticks to the resin whilst some is left exposed on top and not completely covered by resin. Excess gravel is removed once the resin is cured.



This creates a natural looking stone but unlike Resin Bound, Resin Bonded is non-porous and is not SUDS compliant.

Where Can I Use Resin Bound?

Resin Bound can be used in a wide variety of residential and commercial locations in exterior and interior areas.

It is also incredibly flexible and can be used to create letters, numbers or logos. Architects and designers can create any number of bespoke patterns and intricate designs with details reproduced and contrasting colours used to create zones.

Residential, Retail, Leisure

Driveways

Paths

Patios

Parks and Gardens

Concourses

Car Parks

Cycle paths

Race courses
and sports stadia

Picnic areas

Towpaths

Schools, Medical

Centres and Hospitals

Terraces

Bridges

Shopping centres



What is the DALTEX UVR System?

The DALTEX UVR System is a Resin Bound surfacing system with enhanced UV resistance for use as a surface course in landscaping domestic driveways, patios, pedestrian areas, lightly trafficked car-parks, low speed access roads and lightly trafficked areas.

The system comprises of a two-component, solvent-free, cold-applied polyurethane binder (DALTEX UVR resin) and a range of DALTEX dried aggregates (typically 1-3mm and 2-5mm) and C52 sand.

When installed according to DALTEX installation instructions and mix design, this BBA approved system is proven to demonstrate quality, durability and ease of maintenance.

The DALTEX UVR System has been awarded certification by the BBA (the British Board of Agrément) and is manufactured and supplied to meet these exacting guidelines.



What does BBA Mean?

BBA certification is widely recognised throughout the construction industry as a symbol of quality and reassurance.

The BBA (the British Board of Agrément) is impartial and only products and systems that have passed a series of comprehensive assessments – including laboratory tests, on-site evaluations, quality management checks and inspections of production are awarded an Agrément Certificate.

Products that receive Agrément Certificates are recognised by building control, government departments, architects, specifiers and industry insurers. It's a mark of quality, safety and reliability that provides reassurance of the product's fitness-for-purpose. Once the certificate has been awarded, annual monitoring is carried out by the BBA to maintain the Certificate's validity.

To view the DALTEX UVR System Certificate, issued by the BBA please visit: www.bbacerts.co.uk for certificate number 18/5583.



Why Should You Use a BBA Approved System?

In order to achieve BBA certification, the DALTEX UVR System has had to undergo stringent testing and pass the necessary standards for:

Strength and Stability:

Are the systems able to deal with loads associated with vehicular and pedestrian traffic expected from their intended use?

The assessment has included a rigorous set of mechanical tests to mimic load and volume associated with higher trafficked areas.

Surface Characteristics:

How has the surface been designed to deal with slip and skid resistance?

The assessment considered initial and retained slip and skid resistance by taking into account how abrasion from trafficking will affect this key factor over time.

Rainwater Drainage:

Can the system eliminate surface water?

Dealing with surface water is an increasing issue around dwellings. Systems can be designed to reduce or eliminate surface ponding.

Durability:

How long will it last?

Any trafficked system will be subject to varying degrees of foot and vehicular traffic over its expected service life. In order for the systems to perform and be considered fit for their intended use, they must be installed, used and maintained as set out in the BBA Certificate and these instructions.

How to Install a DALTEX UVR System to BBA Standards

Important

Only contractors who have undergone training and passed the training module and site audit run by Derbyshire Specialist Aggregates can advertise that they are installing DALTEX UVR Systems to BBA standards to their customers.

The training consists of a course covering the approved mix designs, site preparation, application instructions, auditing information and ongoing administration requirements. An onsite audit will need to be successfully completed before a certificate is awarded.

Contractors **MUST** complete the following procedures for each project for BBA Accreditation:

1. The system must be supplied to site and mixed as described in the DALTEX UVR installation guidelines and the DALTEX UVR BBA Certificate Instructions.
2. The resin and aggregate must comply with the DALTEX approved mix design. Using the resin on its own or with aggregate not as described in the mix design will not qualify for Approval.
3. The following documentation must be completed:
 - A Day Sheet for every day of the Project and a copy submitted to Derbyshire Specialist Aggregates within one week of project completion (See appendix for day sheet document).

We recognise that not all contractors will wish to undergo the strict auditing and inspection procedures required but we strongly recommend all installations are completed to the standards described in the training.



DALTEX – The No 1 Choice for Resin Bound Aggregates

Derbyshire Specialist Aggregates source materials from all over the UK and worldwide to provide an unrivalled range of colours, sizes and shapes to suit all applications.

Our Resin Bound aggregates and Resin Bound gravels are designed and produced specifically for Resin Bound surfacing. Approved by the BBA for use as part of the DALTEX UVR System, high quality DALTEX dried aggregates deliver beautiful, consistent results time after time.

Production Runs

To ensure consistency, our production runs are between 100 and 300 tonnes per product. As the manufacturer and home of DALTEX dried aggregates, we guarantee 100% stock availability and keep thousands of tonnes of raw material and finished product in stock at our central processing plant in Derbyshire.

The Process

Our unique production process of screening, washing and rotary kiln drying of aggregates is designed to deliver clean, dry aggregates. The product is dried, screened and bagged into polythene bags using one of our four automated packing lines.

40 x standard bags are placed on a pallet, shrinkwrapped for additional protection and made ready for immediate despatch.



...a Fantastic Range of Colours

Resin Bound is amazingly versatile and the DALTEX range of over 30 single colours (the biggest in the UK) can be combined in thousands of different colour combinations to create stunning mixes and beautiful results.

As well as supplying single colours, we also offer **DALTEX Bespoke** – a range of 40 popular blends to suit every project type and property style. We also ensure your customers are completely happy with their choice by offering a 'match any blend' service, You can even create your own unique blends to offer your customers. We can send out samples of any single colour or blend you want or you can order online.

The Full Range

Discover the full range of DALTEX aggregates:
resinbondedaggregates.com



Choosing the Ideal Resin

Derbyshire Specialist Aggregates recommend the use of UV Stable resins for external applications because of the following:

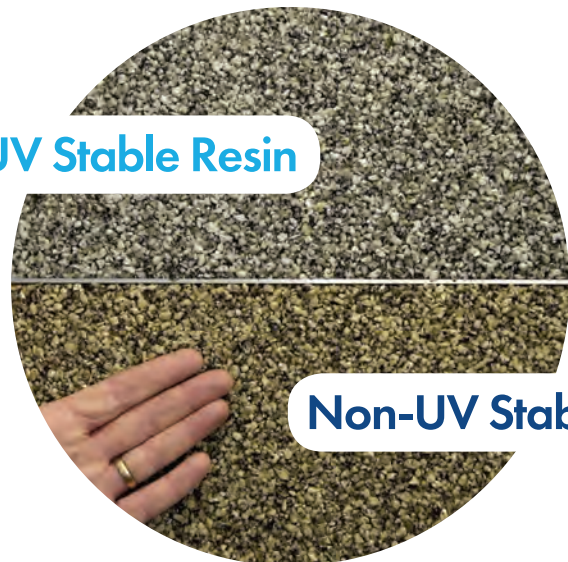
UV Stable

- The effect of natural light on the surface is greatly reduced and fades evenly.
- The natural stone finish is maintained.
- UV systems (Aliphatic hardener) have a more flexible characteristic. This means the surface is less liable to cracking.
- Price – Whilst UVR does cost more than non-UV resin, the difference in price per metre is insignificant compared to having to re-lay a surface or having to explain to a customer why they have variations in colour on their driveway.
- This is a far easier product to trowel and is far more tolerant of differing conditions.

Non-UV Stable

- Darkens when exposed to sunlight sometimes as quickly as within 2 weeks.
- Shading is inconsistent. The areas covered by wheelie bins, cars or caravans will maintain their original colour whilst other areas will darken and become discoloured.
- Non UV systems (Aromatic hardener) is a very strong resin BUT can sometimes become brittle and could in some circumstances crack.

UV Stable Resin



Non-UV Stable

Futureproof Your Installation

Non UV will continue to darken so the initial colour of the installation can change in as little as 2 weeks.

The surface beneath obstacles such as pots, bins etc. will not be affected and stand out when the obstacle is moved. Inconsistent shading will also result wherever an area is protected from UV rays eg. where a car is left on a drive for any period of time, overhanging branches etc.

As the resin surface layer wears, shaded wheel tracks will also become visible.



Example of Colour Change in less than 2 weeks.

The photo demonstrates how much the surface has faded.

DALTEX UVR resin is manufactured in the UK and is certified and approved as part of a BBA System. This means that DALTEX UVR resin must always be produced using the same strict factory conditions and ingredient formula, both of which **cannot** be altered.

This safeguards the consistency and performance of DALTEX UVR resin and provides contractors with the assurance that they are using only the highest quality UVR resin.



Recommended Mix Specification

Derbyshire Specialist Aggregates provide two sizes of kits for DALTEX UVR Resin. Through research and experience, we believe that having the correct ratio of resin to aggregates is critical to achieving a lasting, durable surface and we recommend the following amounts of aggregates.



DALTEX Bound Plus UVR 7.5kg

75kg (3 bags) 2-5mm, 25kg (1 bag) 1-3mm
and 6.25kg (1/4 bag) of C52 sand –
Total 106.25kg – % resin 7.05% –
Coverage approximately 3.55m² at 18mm and 4.0m² at 15mm.



DALTEX Bound UVR 6.5kg

75kg (3 bags) 2-5mm, 12.5kg (1/2 bag) 1-3mm
and 6.25kg (1/4 bag) of C52 sand –
Total 93.75kg – % resin 6.9% –
Coverage approximately 3.13m² at 18mm and 3.6m² at 15mm.

For BBA Approved installations a minimum depth of 18mm must be used.
This is so the surface achieves the required tensile strength for the application.

For pathways with foot traffic only, a depth of 15mm may be used (Please note that this is not to BBA standards).

In the past, a mix of 6.5kg kits with 100kg of stone was used. Tests have shown this resin/aggregate ratio does not contain enough resin and may have resulted in poor performance with some aggregates.

Higher resin content delivers these benefits:

- Greater surface area bond particularly in low density aggregates (eg Daltex Silver). A stronger surface bond delivers greater tensile strength.
- Less susceptible to moisture penetration.
- Reduced risk of 'reflective cracking'.

Pre-installation – Site Survey

Things to Consider

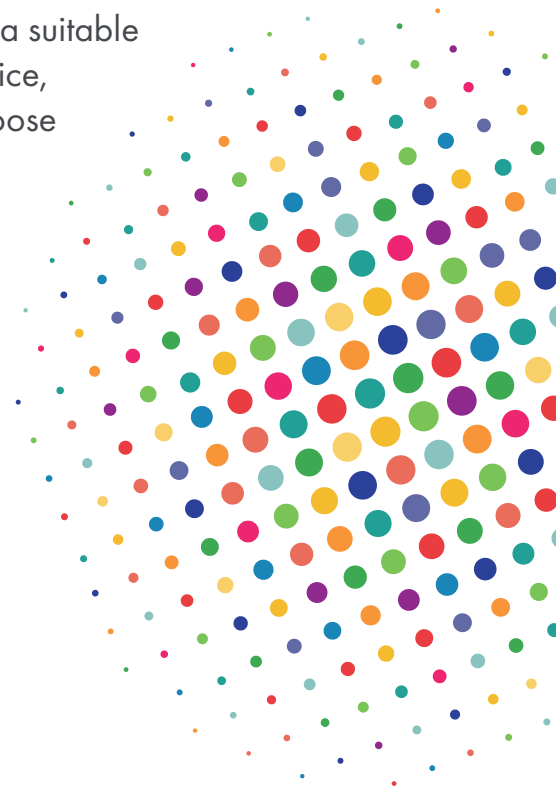
Site examination prior to application is an important stage in the application process as it allows for planning the correct amount of DALTEX aggregates and DALTEX UVR resin required and determining if the substrate is sound.

DALTEX UVR System can be applied to concrete, macadam and compacted MOT Type 3 (foot traffic only). Movement in the sub-base will lead to reflective cracking. Any required repairs to the substrate should be made to minimize damage to DALTEX UVR System post application.

All imperfections in the substrate must be reinstated with a suitable material. The substrate must be clean, dry and free from ice, frost, loose aggregate, oil, grease, road salt and other loose matter which may impair the adhesion of the system.

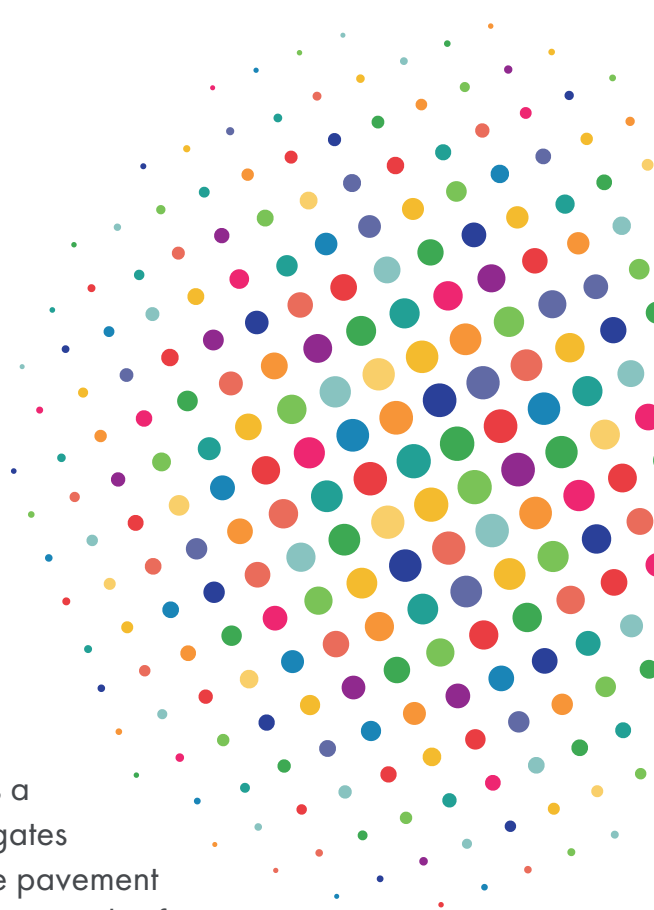
Site drainage across the application area should be considered, and where an application area meets a wall, the damp course should be taken into consideration to avoid pooling of water or water soaking into masonry.

Surface preparation and primer application is very important.



Please consider the following:

- **The Surface of the Site** – does it need a new Base?
- **Is the Base Stable?** The Resin Bound System will only be as stable as the Base it is laid on. If in doubt suggest a new Base.
- **Is there any Cracking? Structural or Movement** – this will need to be reinstated i.e. cutting out and refilling. Geotextile cracking mesh may also be solution.
- **Expansion Joints** – any existing joints in the base will need mirroring in the Resin Bound surface.
- **Damage** – holes, degradation? Does it need re-instating or can it be covered with the Resin Bound surface at an increased depth?
- **Tree Roots** – are they to be covered with the Resin Bound or left proud of the surface? Advise the customer on the tree roots (i.e. they will always win). We suggest a disclaimer is put in place.
- **Edging** – what is the Resin Bound surface going to be edged with? Setts, beading? Will the existing edging be suitable? Will it need replacing or protecting from the resin? Does anything need taping or sheeting? Use a new edge against existing fences or gravel boards as the surface will be disrupted if they need replacing.
- **Check for Slopes** – is this going to cause an issue?
Is there an Anti-Slip requirement?
- **Steps** – are the surface of the steps to be Resin Bound? Edging will probably be required for delineation purposes from a health and safety perspective.
- **Manholes** – are screed trays or recessed manholes required?



- **Threshold Edging** – consider how this will be resolved.
- **Area to Set Up and Work** – make sure there is a suitably sized area to mix and have the aggregates delivered to. This will more than likely be on the pavement outside the property. Ensure that the area is secure and safe from passers-by.
- **Delivery:** Remember if you are having a direct delivery of the aggregates, it will probably arrive on a tail lift lorry with manual pump truck. The area will need to be flat and hard standing. Your order cannot be delivered onto grass, gravel or slopes. To avoid having to move pallets of aggregates, it is advisable to have someone present for the delivery to ensure everything is put in the right place. **It is always better to have the delivery the day before!** Deliveries with hiabs or fork lifts can be organised at an additional cost.
- **Cleaning** – how much does the drive need cleaning?
- **Priming** – does the drive need priming?
- **Check Meterage** – allow for natural undulations, consider the type of surface you are laying on and over order by between 5 and 15% to allow for any variances.

The 'Pre-installation Site Survey' audit sheet acts as a useful easy to use checklist and helps ensure you allow for all the necessary materials and time required to complete the project (See appendix).

Pre-installation Preparation

The surface must be free from contamination or water prior to application, as such cleaning/drying may be required. The ambient temperature, relative humidity and ground temperature should be tested and recorded prior and during application. (See Appendix – Day Sheet).

All substrates to be coated should have a surface temperature at least 3°C above dew point and rising to reduce the risk of delamination due to condensation or surface foaming of the system. (See Appendix – refer to Dew Point Chart).

Cleaning

Surface preparation and primer application is extremely important. All surfaces should be free from dust, grit, grease and liquid. Ensure that the surface is clean and dry before proceeding with the application. If the system is being applied onto a difficult to bond to surface, such as concrete, the use of a primer is advised to ensure a full bond between the DALTEX UVR System and the substrate.

The driveway needs to be completely clean prior to laying the Resin Bound surface as any dust, dirt or moss will contaminate the resin and prevent adhesion (bonding). Power wash to remove all detritus and organic material. Ideally this should be done the day before installation, so the driveway has a chance to dry completely. If drying needs to be accelerated, heat guns can be used (except on macadam).

Preparation of Macadam Surfaces

Macadam should be a minimum of 7 days old to ensure it is fully cured before installation. Prior to installation, inspect the surface of the macadam for any tar residue, if tar residue is present clean the surface with a detergent solution, flushed with water and the surface allowed to dry. Once the surface is dry installation can proceed.



Preparation and Priming of Concrete Surfaces

Primer

Application temperature 10°C-35°C, 15°C-18°C is optimum for ease of application. The relative humidity should be between RH 30%-85%.

If in doubt about moisture on the surface – use a Hygrometer.

Equipment should be protected from contamination with water, grease and oils. If the system is to be applied outside then protection against the rain should be ensured. Personal protective equipment should be worn. As primer is solvented, the use of open flames or red hot surfaces should be prohibited.

Areas not to be coated should be protected with masking tape to avoid unnecessary cleaning after application as resin will stain bricks or pavers.

Primer is best applied with a roller. Typical application is 150gsm. The final surface should appear smooth and free from foreign particles.

With new concrete bases, ensure that the concrete has fully cured, ideally for 28 days.

A breathable concrete sealer can be used as an alternative. This will allow the concrete to continue curing as a Resin Bound surface is permeable.

Remedials and Reinstatements

All damaged areas should be removed to a minimum of 200mm depth and reinstated with either:

- a) 100mm type 1 MOT hardcore (mechanically compacted) and 100mm of concrete for concrete bases.

OR

- b) 100mm type 3 MOT hardcore if used as a permeable macadam repair.

Cracks can be repaired using a geotextile mat, bitumen strips, or elastic crack repair.

Levelling:

This can be achieved 2 ways:

1. Small undulations can be addressed with surface installation.
(Be careful that it does not affect the amount of aggregate you have available to complete the installation.)
2. Levelling compounds. I.e. Exterior floor levelling (Cempolay ultra, Flow top etc.) or site mix Granolithic concrete.

Edging detail:

Set block or concrete kerbs to protrude to the level of surface to be installed. 18mm is recommended, above the existing base edge. It is not advisable to edge up against an existing fence or gravel board. If the fence moves or has to be replaced in the future, the Resin Bound surface could be disrupted.

Manhole covers:

Replace with recessed alternatives (known as screed trays or block paving drains).



TOP TIP

Drill holes in the sides of the screed tray to allow water to drain through.

Drainage:

Install Aco drainage channels or soakaways as required (See SUDS summary - page 5).



TOP TIP

A Resin Bound surface can be laid over the top of ACO drains as it is porous.

Marking Out the Site

Some contractors mark the area out in square metres (mixes). This can serve as a guide and an early indicator of using too much aggregate (laying too deep) or too little (not deep enough).

The surface needs to be completely dry prior to laying the surface.

Water and resin do not mix!!

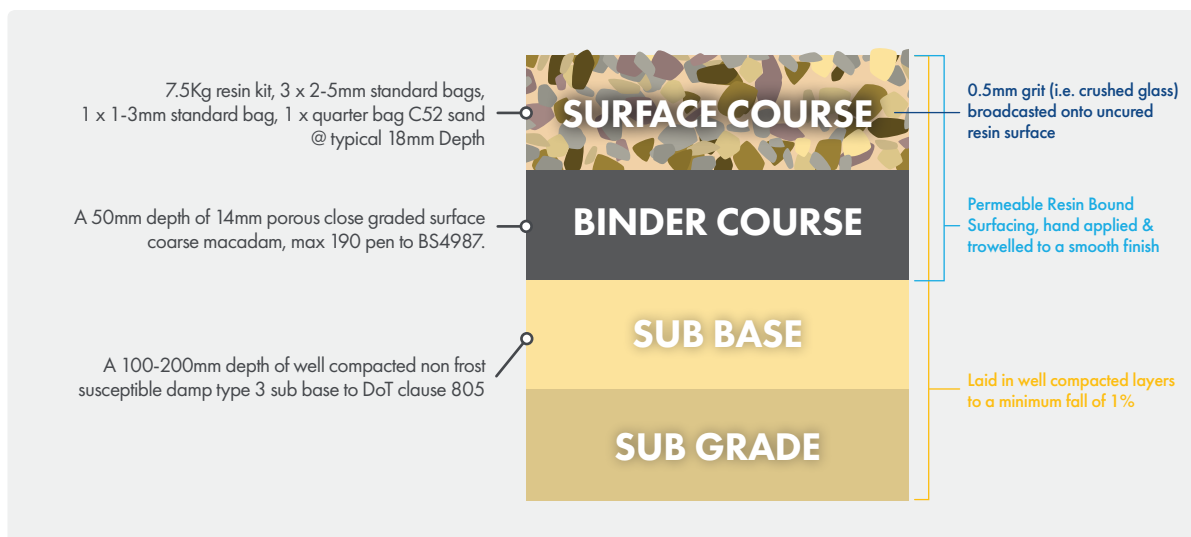


- 1 Step:** Think about adding a step detail.
- 2 Cracks:** Use cross layer membrane to cover cracks or if expansion joints replicate in Resin Bound surface with beading.
- 3 Repairs:** Badly damaged areas to be removed to a minimum of 200mm depth and reinstated with 100mm type 1 MOT hardcore (mechanically compacted) and 100mm of concrete.
- 4 Boundary:** Always install an edge on a boundary as if that boundary is removed it can damage the Resin Bound surface, especially if up to a fence, which could move or be removed.
- 5 Edging Detail:** Block or Concrete kerbing set to protrude 18mm above existing base edge.
- 6 Expansion Joints:** These should be carried through to the surface of DALTEX UVR System. Any day joints or expansion joints should be detailed with a suitable edging strip eg aluminium edging or similar.
- 7 Cleaning:** Power wash to remove all debris and organic material.

Resin Bound Base Requirements

Macadam Base Course

TYPICAL BASE BUILD UP – PRIVATE DRIVEWAYS/PATHS/PATIOS
(Permeable and SUDS compliant)



PURPOSE:

To provide an attractive, durable and seamless natural stone or gravel finish.

ADVANTAGES:

An attractive and durable surface that allows water to pass through the surface and is easy to clean.

NOTES:

Resin Bound can be overlaid onto existing concrete or macadam surfaces of suitable construction for the traffic expected.

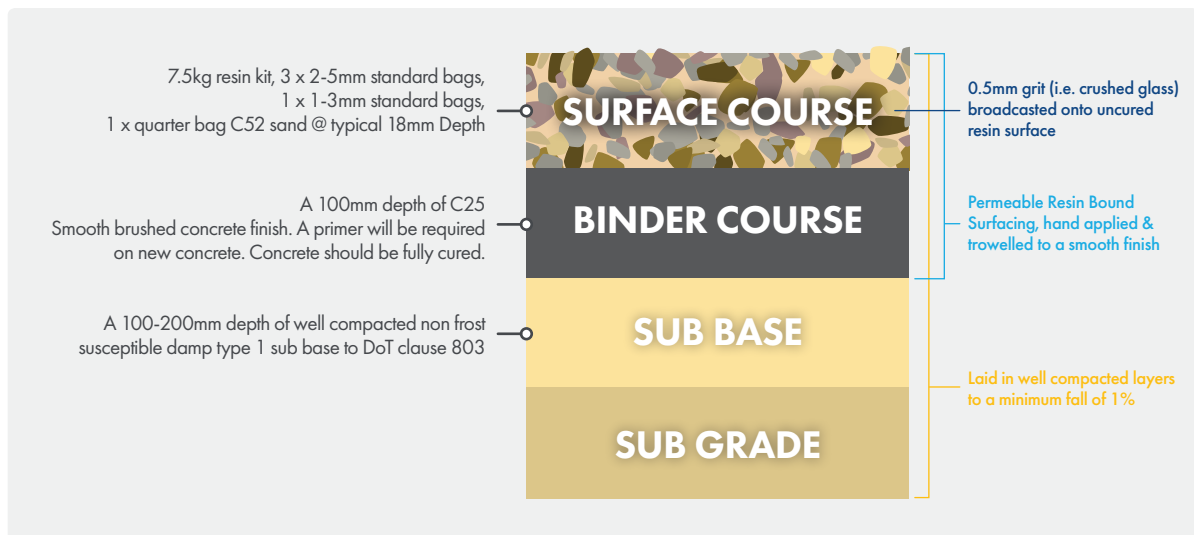
Joints or cracks should be broken out to a minimum of 200mm width and in filled with well compacted macadam or concrete base layers as above.

The specification is based on normal good practice for flexible surfacing and does not absolve the specifier from designing a construction suitable for the expected traffic and ground conditions pertaining on a given site. Areas that may be heavily trafficked by heavy vehicles should have structure layers designed according to DoT requirements. The thickness of the sub base layer required is dependent on sub grade soil condition.

Resin Bound Base Requirements

Concrete Base Course

TYPICAL BASE BUILD UP – PRIVATE DRIVEWAYS/PATHS/PATIOS
(Non-permeable – Additional drainage required to comply with SUDS)



PURPOSE:

To provide an attractive, durable and seamless natural stone or gravel finish.

ADVANTAGES:

An attractive and durable surface that is permeable and remains easy to clean.

NOTES:

Resin Bound can be overlaid onto existing concrete or macadam surfaces of suitable construction for the traffic expected.

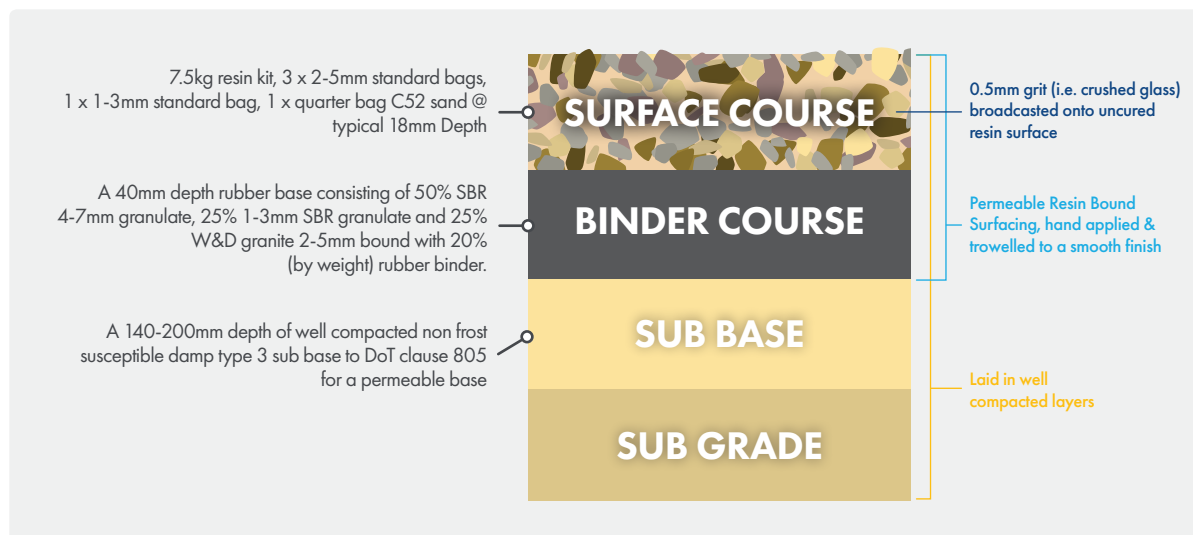
Joints or cracks should be broken out to a minimum of 200mm width and in filled with well compacted macadam or concrete base layers as above.

The specification is based on normal good practice for flexible surfacing and does not absolve the specifier from designing a construction suitable for the expected traffic and ground conditions pertaining on a given site. Areas that may be heavily trafficked by heavy vehicles should have structure layers designed according to DoT requirements. The thickness of the sub base layer required is dependent on sub grade soil condition.

Resin Bound Base Requirements

Rubber Base Course

TYPICAL BASE BUILD UP – PRIVATE DRIVEWAYS/PATHS/PATIOS
(Permeable / SUDS compliant)



PURPOSE:

To provide an attractive, durable and seamless natural stone or gravel finish.

ADVANTAGES:

An attractive and durable surface that allows water to pass through the surface and is easy to clean.

NOTES:

Resin Bound can be overlaid onto existing concrete or macadam surfaces of suitable construction for the traffic expected.

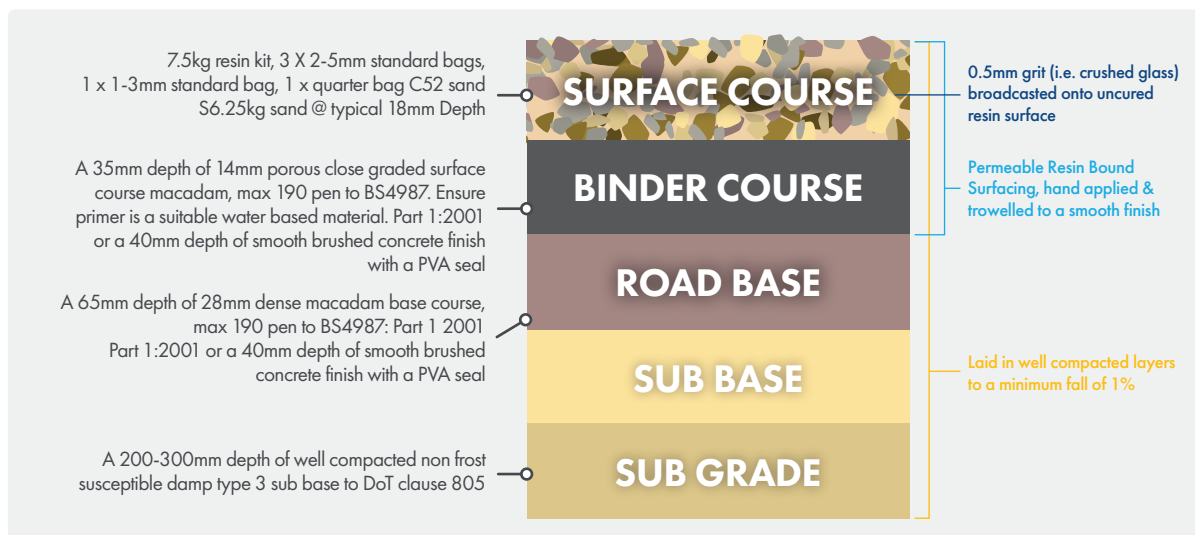
Joints or cracks should be broken out to a minimum of 200mm width and infilled with well compacted macadam or concrete base layers as above.

The specification is based on normal good practice for flexible surfacing and does not absolve the specifier from designing a construction suitable for the expected traffic and ground conditions pertaining on a given site. Areas that may be heavily trafficked by heavy vehicles should have structure layers designed according to DoT requirements. The thickness of the sub base layer required is dependent on sub grade soil condition.

Resin Bound Base Requirements

Car Parks and Roadways

TYPICAL BASE BUILD UP – CAR PARKS AND ROADWAYS



PURPOSE:

To provide an attractive, durable and seamless natural stone or gravel finish.

ADVANTAGES:

An attractive and durable surface that allows water to pass through the surface and is easy to clean.

NOTES:

Resin Bound can be overlaid onto existing concrete or macadam surfaces of suitable construction for the traffic expected.

Joints or cracks should be broken out to a minimum of 200mm width and in filled with well compacted macadam or concrete base layers as above – or a geotextile membrane.

The specification is based on normal good practice for flexible surfacing and does not absolve the specifier from designing a construction suitable for the expected traffic and ground conditions pertaining on a given site. Areas that may be trafficked by heavy vehicles should have structure layers designed according to DoT requirements. The thickness of the sub base layer required is dependent on sub grade soil condition.

Disclaimer

The details given in this specification are intended only as a guide. Actual details should be developed by the project designers taking into account the specific circumstances of the intended application. Derbyshire Specialist Aggregates assumes no responsibility for improper reliance upon or misuse of the data herein. Product design and specification are subject to change with further notice.

How to Mix the Resin and use of Catalyst

The formulation of resins, mixed with dry graded aggregate, has been carefully designed to suit the requirements of the site. It is essential that the specified blend is not varied by the contractor. The process of mixing and laying is simple, but it requires accuracy and care at **EVERY** stage.

Mixing of the resin is a very important part of the process. Shortcuts must NOT be taken. It is recommended to use one batch on a project. If more than one batch is used, care should be taken to use the same batch in one area in case of small batch to batch variation.

Mix the resin in the container on a plasterer's board or some other protective surface in case of splashes.



Make sure the resin container is secure (between your feet) before you start mixing.



The Part A component resin should be mixed briefly (10-20secs) using a slow speed, high torque, helical blade mixer. Accelerator should be added at this stage if needed – see accelerator guidelines for details.



Part B component resin should then be added and mixed thoroughly at slow speed for approximately 2 minutes until uniform.

Cure Speed Modification

The surface should be allowed to cure for 4 hours at 20°C; this will be longer if the temperature is lower. At low temperatures, accelerator (catalyst) can be added to maintain cure speed.

Accelerator must be used for temperatures below 17.5°C (especially note overnight temperatures) as this can lead to longer curing times and contamination of the surfacing. Accelerator should be used with each mix to ensure uniformity of cure except for higher consistent temperatures of 25°C.

Accelerator (Catalyst) Guidelines

The tables below gives approximate addition levels.

Part A should be mixed prior to adding the accelerator (catalyst). Use the syringe provided to dispense accurately into the part A component of the resin and mix for approximately 15 - 20 seconds before adding the **Part B** component.

| Air Temperature °C | Accelerator (Catalyst) Addition Level 7.5kg |
|--------------------|---|
| 17.5 | 5.1 ml per 7.5Kg kit |
| 15 | 11.3 ml per 7.5kg kit |
| 12.5 | 19.2 ml per 7.5kg kit |
| 10 | 33.8 ml per 7.5kg kit |

| Air Temperature °C | Accelerator (Catalyst) Addition Level 6.5kg |
|--------------------|---|
| 17.5 | 4.4 ml per 6.5Kg kit |
| 15 | 9.8 ml per 6.5kg kit |
| 12.5 | 16.6 ml per 6.5kg kit |
| 10 | 29.3 ml per 6.5kg kit |

How to Mix Aggregates with Resin

Ambient and base surface temperatures, along with relative humidity, should be recorded at the start of the installation process. If the weather is variable readings should also be taken during the installation process.

INSTALLATION SHOULD NOT PROCEED IF:

- The relative humidity is outside the range of 30%-85%.
- The surface temperature is less than 3 °C above the dew point of the measured air temperature and the relative humidity.
- The operating temperature and road surface temperature and/or air temperature is outside the range 10 °C to 35 °C.

(See Appendix – Dew Point Chart for guidance)

The aggregate should be sorted into the required number of mixes. Mix bags of aggregates from each pallet to guarantee a consistent mix.



IMPORTANT POINTS TO REMEMBER

1. Incorrect mixing of the resin will cause the material to fail. The operative must monitor the efficiency of resin mixing by checking the empty tubs. After circa 30 minutes, they should scrape out the skin of the congealed resin from the first few tubs with a sharp tool. There should be no liquid residue between the skin of the resin and the base or sides of the tub. Repeat this check randomly at least once an hour.
2. Keep the resin as cool as possible. On a hot day we recommend you do not keep the resin in your van or in direct sunlight and a reflective cover can be very effective in keeping the resin cool.
3. DO NOT USE aggregates that appear damp in the bags.
4. Insufficient mixing time in the mixer may give rise to uncoated material.
5. For each batch, make sure that the correct blend of aggregates is used.
6. Aggregates can also absorb heat and should be kept away from direct sunlight. The aggregates will heat up and this will increase the curing time.
7. Laying a Resin Bound surface on to macadam on a hot day will also increase the curing time of the resin.
8. Start the job early if it looks like it is going to be hot!

BEFORE YOU START

1. Is rain forecast? – Do not attempt to lay if rain is forecast during installation or within 4 hours of completion.
2. Get a rain app for your phone.
3. Use an outdoor Hygrometer to test for humidity.
4. Is the ground/surface wet? – Delay install or force dry with a gas lance.
5. Is the humidity below 80%? – Higher and there is a chance of rain and moisture in the air.
6. Is the surface temperature at least 3 degrees higher than the Dew point temperature? – Use a Hygrometer. Delay install or force dry with a gas lance if appropriate.
7. Has the surface been primed? Primer must be tacky dry ie if gloved finger is pressed to primer it should just be slightly tacky.

8. Have materials been checked (quantity, batch, colour etc.) and area re-measured?
9. Have trowels and equipment been cleaned and ready for use?
10. At the end of the day, use a light coat of WD40 in the mixer to aid cleaning.
11. All cracks have been repaired.
12. All edging is protected with tape to avoid resin staining.

SAFETY

- Whilst skin contact should be avoided by the use of PVC gloves or gauntlets, the accelerator (catalyst) can, upon skin contact, cause blisters to appear so great care must be taken in its use.
- Eyes should be protected from splashes and from stones flying out of the mixer with the use of goggles.
- All operatives should wear overalls.
- Any safety guards on the mixer should NOT be removed, avoiding the risk of injury from the paddles.
- The aggregates have been dried and screened, so dust will be minimal. If any dust occurs an approved nuisance grade dust mask must be used.
- Approved ear defenders must be worn when in proximity to mixers, generators etc.
- PPE to be worn as per site rules.
- NEVER heat the resin to aid the mixing, this can liberate harmful vapour. Never spray the resin as this is also harmful.
- Xylene thinners or white spirit are advised for cleaning floats and other hand tools.

Safety data sheets are available on request.

The Installation Team – the Mixer

Be Consistent – Be Clean – Be Safe

STEP 1

Place the first 25kg bag of 2-5mm stone and the bag of 1-3mm stone.



STEP 2

Add the premixed resin immediately to the pre-mixed aggregate. Now is the time to start your stopwatch.



STEP 3

Add the two bags of 2-5mm stone.



STEP 4

Add the C52 sand slowly and steadily to ensure an even consistency.



Stages 2-4 must be mixed for the same amount of time on every mix! Failure to do this will cause a variation in the colour mix. Ideally use a stop watch to ensure consistency for every mix.

It should take no longer than 5 minutes once the resin has been added. Once the sand has been added, ensure it has been distributed evenly through the mix.




IMPORTANT!!

Ensure each batch is mixed for **exactly** the same time, as the colour of the finished material can alter with small changes in mixing time. It is advisable that a stopwatch is used to ensure that the correct mixing time is adhered to consistently.



TOP TIP

Make sure the mixer man has a stopwatch to ensure every mix is the same!



Switch the mixer off and empty the mix into your lined barrow.

Ensure all the mix is scraped out of the mixer – taking special care to remove it from the blades and from the door of the mixer where it will tend to gather.

The “Luter” then takes the mix to the “Troweller”.

The Mixer cleans the mixer down and checks that it is in good order.

It is important to clean the mixer down each time to avoid build-up of resin and lengthy cleaning of cured resin at the end of the day.

This also avoids contamination and clumping as any residue from previous mixes could potentially end up in a new mix.

Wipe the mixer with white spirit till all the residue of the previous mix has gone. Once the mixer is thoroughly cleaned, the mixer is ready to start with the next mix.



IMPORTANT!!

Whilst cleaning check:

The blades are not worn – excessive wear will mean the mix is not mixed evenly and will get stuck underneath the blades. It will also take longer to mix and will not mix evenly.



TOP TIP

At the end of the day lightly spray the inside of the mixer with WD40 when clean.

The Installation Team – the Luter



The Luter needs to tip manageable quantities of material between the batons. It is important to judge the right amounts because if too much material is tipped it will take more trowelling and work.

The Luter must spread the mix as evenly as possible between the batons.



Most importantly, the Luter needs to look at the surface that has been previously trowelled out and check for trowel marks and inconsistencies in the surface, **from every possible angle**.

Any anomalies can be easily rectified at this stage before the mix has cured.



The Installation Team – the Troweller

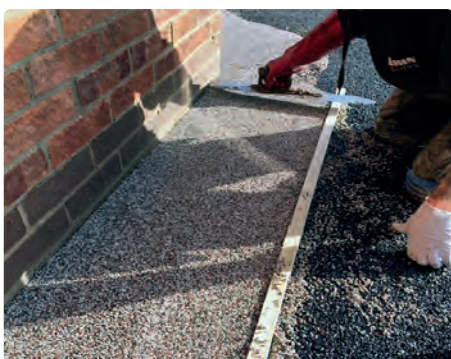


The Troweller's job is to plan the laying route and grid the area out in squares with chalk. The Troweller lays batons in place to indicate where he wants the Luter to tip the mix.

Once the Luter has levelled the mix, the Troweller can begin.



The main objectives are to knit the mix together, smooth the surface and leave a final sheen ('polish'). This must all be done using a hand trowel or lightweight finishing tool and with the least amount of strokes possible.



The Troweller must judge the levels and depth of the mix. Care should be taken to ensure that the correct coverage rate is evenly applied across the area. One way to check the levels are even is for the Troweller to lay a large trowel on top of the mix (like a spirit level) to judge any uneven parts of the surface.

In order to knit the mix together, the Troweller must ensure the aggregates form a closely compacted surface. The trowel must be used with the edge slightly raised away from the stroke. This will prevent the trowel digging into the mix.

The Troweller must trowel the mix until all the aggregates stop moving in a fluid movement and become solid. To test this cut a section into the edge of the surface being trowelled to see if it slumps or stays intact.



IMPORTANT!!

The last stroke of the trowel must be always be in the same direction otherwise it can cause a striped effect on the finish.

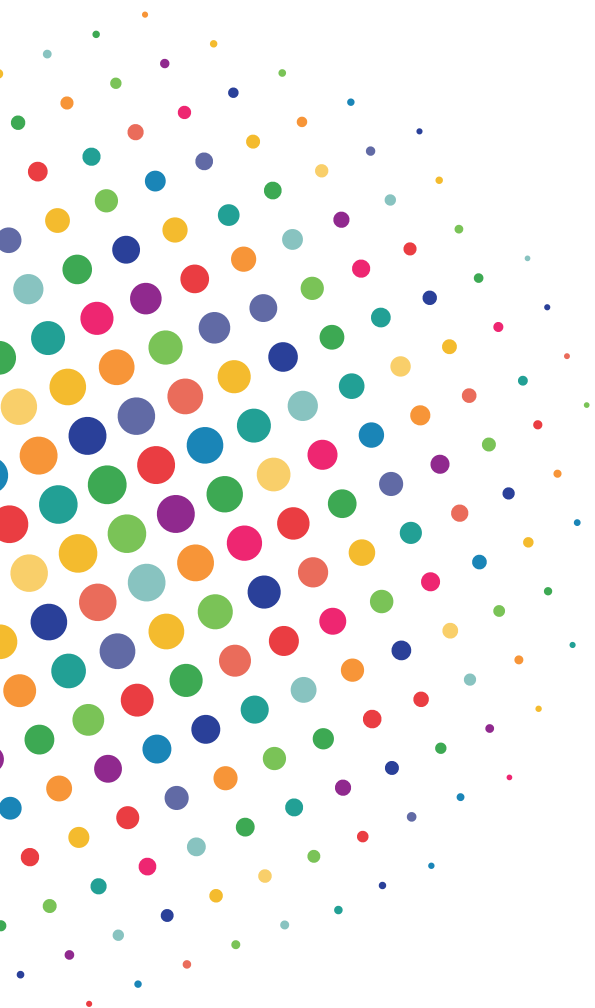
The surface should be installed to a minimum of 18mm for driveways. For areas with foot traffic only, a depth of 15mm may be used. Once levelled and compacted, the surface can be smoothed (polished). Ensure your trowel is cleaned regularly using white spirit or xylene and especially before the final polish to ensure a smooth finish. Water should not be used as it may cause foaming in the system.



TOP TIP

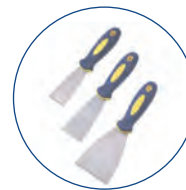
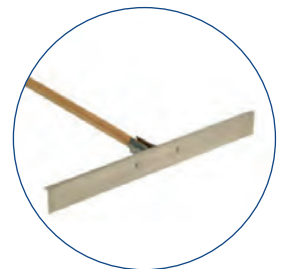
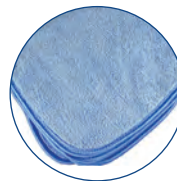
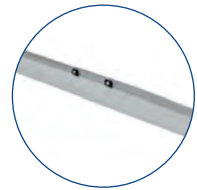
To create a non-slip surface the top can be scattered with glass grit. Application rates will vary depending on the aggregate used but it is in the range of 50g-100g/per m². This should be lightly scattered after each mix has been trowelled.

The Resin Bound system must be allowed to cure. During the curing period no disturbance or trafficking is permitted and the surface should be protected from rain.



Equipment Required

- Forced Action Pan Mixer
- Generator or Power Supply
- 110v Transformer and Lead
- Drill with slow start facility
- Whisk Paddle
- Gaffer Tape
- Resin Trowel
- 5L/10L Buckets, Scrapers and Small Paint Brush for keeping Mixer Clean
- Plenty of Cleaning Rags
- Wooden Lute
- Knit Wrist and Latex Gloves
- Clean Wheelbarrow – Polythene Liners recommended
- Clean Shovel
- Stanley Knife
- Tarpaulins
- WD40
- Gas Burner and Bottle
- Stiff Brush
- Knee Pads
- Disposable Trousers
- Stopwatch
- Gazebo
- Hard Barriers, Cones and Warning Tape
- Beading if required
- Reflective Blankets (to cover stone and resin in hot weather)



Avoiding Costly Mistakes

Unexpected Rain

Rain and resins do not mix well. It is highly likely that the surface can be damaged should it rain during or shortly after installation (min 4 hours). There are however, steps you can take to reduce the risk of permanent damage.

- 1) Erect a good quality 3 metre gazebo and ensure the forced action mixer is underneath it.
- 2) Ensure the resin is mixed in the dry.
- 3) Cover ALL stone with tarpaulins.

These steps can be taken if the installation is nearing completion. If the job isn't near completion or the rain is heavy and prolonged, it is advisable to terminate the edge of the last laid mix to a neat line, laid and finished at the correct depth and return the following day to complete. A 'day joint' is likely to be visible.

Accept the fact that if you've been caught in the rain it is likely you will have to relay the surface.



TOP TIP

Get a good weather app for your phone.

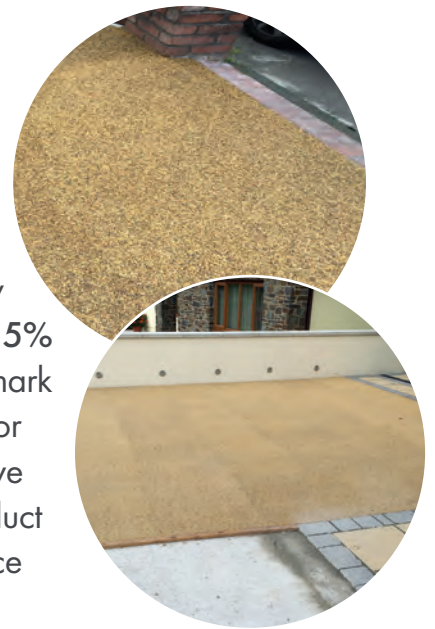
Mix Curing Too Quickly – Higher than Anticipated Temperatures

In the height of summer, surfaces can be as much as twice the temperature of the ambient air temperature. This is especially true of black surfaces such as macadam where the resin can cure in as little as 10 minutes.

If laying to macadam surfaces during a hot spell, **Start early** before the temperature reaches its height and **keep resins in the shade, but do not store in a van**. Leaving resin tubs in direct sunlight can significantly reduce cure times. Also it is advisable to **keep the aggregates out of the sun** as the stone will also heat up and increase the temperature of the mix.

Running Out of Stock

Coverage rates can vary according to stone type and accuracy in the depth of laying. Installers should always carry at **least 5-15% more** stock than the coverage rates stated. It is a good idea to mark out the surface (with line marker paint) every 10 square metres or so. Regularly checking the usage versus the marked lines will give you an opportunity early on in the installation to anticipate product shortage which could possibly give you the opportunity to source more product before it is needed or to correct the over usage.



Surface Shading

This cannot be rectified after the resin has cured. Each resin batch must be the same! Shading can occur if mixes are prepared inconsistently. i.e. left in the machine (or the wheelbarrow) for different amounts of time. It is important to mix each mix for exactly the same time, every time.

Surface shading can also be caused by an inconsistent trowelling action and pressure, especially towards the end of the day when tiredness sets in. It is important that everyone looks at the surface from different angles to ensure there are no inconsistencies.

Someone Walks on the Surface After It Has Been Laid

If this happens shortly after the surface has been laid (within 2 hours) and the damaged area is accessible without causing more damage, it should be possible to re-trowel the affected area flat.

If this cannot be rectified and the surface has fully cured, carefully chisel out the affected area (do not mechanically cut). Mix up a small amount of stone and resin/hardener. Use syringes to measure out correct quantity of resin/hardener and postal scales to weigh out the correct amount of stone. Carefully compact the new mix into the exposed area.

Hard Barriers are Recommended.

Clearly marking the area with hard barriers, cones and warning tape will help prevent people inadvertently walking on the surface.



TOP TIP

It is a good idea to take some photos of the area with the cones and tape in place. Beware of cats – these are the worst culprits!!

Reflective Cracking

This is when the surface develops cracks over time due to the base moving.

If the base has moved and you have installed the base, you will have to repair. However make it clear to the customer that if you have not put the base down then you aren't responsible for any subsequent cracking.

Tree Roots

This potential problem needs addressing prior to installation and we recommend you discuss this with your customer and include a disclaimer.

Tree roots will always win in the end. If the decision is made that roots are resined over, the customer needs to be aware that they will eventually cause disruption in the surface.

Iron Spotting

Some aggregates contain a naturally occurring element of iron. If this is released from the mix this can cause a dark stain. There are however two different types of stains that can occur and each requires a different method to resolve the issue. Seek advice in the first instance. We can help identify the cause and remedial action needed.

One of the ways to avoid iron spotting is either not to use the aggregate concerned or to ensure that a higher than normal resin content is used.

It has been noted that in surfaces where a high resin content has been used, problems of this nature seldom occur.

Surface Clouding

This can be caused by moisture dropping onto the surface before it has cured or humidity. This can even be caused by rain spots and sweat or by accidentally flicking excessive white spirit onto the surface when cleaning the trowel.

Avoid rain as previously discussed. It is better not to lay if the humidity is above 80%. Use a Hygrometer if in doubt. **You cannot remove these stains after the resin has cured so prevention is paramount.**

Loose Stone

This is caused by poorly mixing aggregates with resin so that not enough resin has coated the stone. It can also be caused by badly worn blades or not using enough resin. In all instances the stone will not adhere to the mix and become loose.

Customer After Care and Maintenance

Whilst every effort has been made to ensure that the Resin Bound surface is of the highest quality, it will look better and last longer if a few simple maintenance procedures are adopted.

NORMAL USE:

Resin Bound surfaces are intended to be used by normal pedestrian or vehicular traffic for which they have been designed. Protection should be provided wherever possible against abnormal damage. Heavy goods vehicles should not be permitted to park on or regularly traverse Resin Bound surfacing unless it has been allowed for in the overall construction.

ABNORMAL USE:

Heavy objects, such as waste skips, should not be dragged across the surface and protection should be provided during building and construction work to avoid unsightly contamination from oil, grease, cement and dirt. Spillage of solvents should be avoided as these will soften and damage the resin binder.

ROUTINE MAINTENANCE:

The Resin Bound surface should be regularly swept clean with a stiff broom, removing leaves and detritus materials in order to prevent moss growth and hosed with clean water.

WASHING:

The surface must be cleaned periodically using a pressure washer or a sweeper fitted with water jetting and vacuuming equipment. Washing can be carried out using a portable pressure washer (up to 150 bar rating) to remove dirt, grime and moss. Ensure care is taken not to damage the surface with excessive pressure. Only cold water should be used and the water lance must be kept at least 200mm from the surface and a fan type jet used.

CLEANING:

Chewing gum removal: Removal of individual pieces of chewing gum can be carried out by treating each piece with a freezing spray and then scraping off the hardened gum with a wall/paint scraper. For more extensive gum removal, contact a specialist cleaning contractor.

MOSS AND ALGAE GROWTH:

Weed growth should be treated prior to surfacing and it is highly unlikely that any new growth will be sustained. Periodical application of a proprietary moss and algae killer, such as "algon", in accordance with the manufacturer's instructions, will remove and prevent any regrowth. Ingrained algae growth can be removed and the colour of the original surface restored by the application of a strong bleach solution. This should be used in accordance with manufacturers guidelines and local environmental constraints. After application, the surface should be well rinsed with clean water.

WEED RESISTANCE:

Due to its construction, a Resin Bound surface is resistant to weeds. However, no matter how much care is taken, weeds may occasionally appear (as on any surface), usually as a result of windblown seeds. Small numbers of weeds can be removed by hand without damaging the surface. If the weeds are removed by hand, it is important to ensure that the full root of the weed is extracted, not broken off. Some weeds are more prolific if they are simply cut off at surface level. If the weeds are deep rooted, it is advisable to kill them off with an appropriate herbicide or weed killer. Localised areas of weed seeding infestation can be treated with domestic weed killers without causing damage to the surface.

Please note that staining may occur from tanning if surfaces are not kept clean from leaf debris, twigs, seeds etc.

CEMENT OR CONCRETE MARKS:

Cement or concrete marks can be removed with careful use of diluted hydrochloric acid or a proprietary cement remover, immediately followed by a thorough rinsing with clean water. (Please note that if a lime based aggregate is used, the acid will tend to dissolve this as well).

OIL/FUEL CONTAMINATION:

Oil stains must be removed as soon as possible by using a mild detergent to prevent possible staining and degradation of the surface. A good quality detergent should be applied neat using a stiff brush. This should be allowed to penetrate for 10 minutes and followed with pressure washing.

SPILLAGES:

It is important that any spillages or contamination are dealt with promptly otherwise permanent staining, marking or physical damage to the surface and underlying materials may result.

SAND/SOIL:

Shovel up material and sweep the surface with a stiff brush. Pressure washing up to 150 Bar can also be used to clean sand from Resin Bound surfacing.

MINERAL STAINING:

The system is made up from natural aggregates. Whilst every step is taken to minimise its presence, naturally occurring iron pyrites may be present. If staining occurs, oxalic acid is an effective method of removing the stains from the surface and is readily available. The specialist acid solution should be washed off using cold water immediately after use.

ICE/FROST:

Salt can be used on the surface to help eliminate ice and frost, Once weather conditions return to normal, the salt/grit needs to be washed off thoroughly to remove all salt traces.

CHEMICAL RESISTANCE:

Resin Bound surfacing is resistant to a wide range of chemicals. The full chemical resistance builds up over time and care should be taken within the first 7 days of installation to not expose the surface to chemicals.

PATCH REPAIRS:

If the surface is damaged, small areas can be repaired. The damaged area should be chiselled out. The same aggregate blend can then be mixed with DALTEX UVR Resin and installed in the area. Care should be taken to 'feather' the edges of the repair into the surrounding area, to give a strong, seamless and durable repair.

Appendix

Template Examples





derbyshire specialist
aggregates



FOR MORE INFORMATION CONTACT
OUR TECHNICAL AND SALES HELPLINE

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