THE ONE STOP
RESIN SHOP

Daltex
UVR SYSTEM

INSTALLATION ADVICE

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THE ONE STOP RESIN SHOP

Daltex UVR SYSTEM

What is the DALTEX UVR RESIN BOUND 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 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 system is proven to demonstrate quality, durability and ease of maintenance.

Recommended DALTEX Mix Design Specification

We recommend using 7.5kg of DALTEX UVR Resin in each mix. 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.

A minimum depth of 18mm must be used. This is so the surface achieves the required tensile strength for the application. Sand increases the strength of the Resin Bound surface by approximately 15-25% and will contribute to the anti-slip properties of the finished surface.

15mm depth can be used for pathways, however, we highly recommend all installations are applied at a minimum depth of 18mm to ensure the aggregate is knit consistently.

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 106.25kgs – % resin 7.05% –
Coverage approximately 3.55m² at 18mm and 4.0m² at 15mm.

CALCULATING HOW MANY MIXES YOU NEED

To work out the correct number of mixes required, we advise dividing the area (in m^2) by the spread rate at your required depth.

For example:

Driveway area = **155m²**
Blend = **Cappuccino**
Coverage rate at 18mm depth = **3.5m²**
Divide 155 by 3.5 which will give 44.28 mixes.

Round that up to 45 then we always recommend a 5-10% contingency to allow for any discrepancies or undulations in the surface.

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How to mix the Resin and Catalyst Guidance

MIXING DALTEX UVR RESIN

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 cares at **EVERY** stage. Mixing 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/Catalyst should be added at this stage if needed – see Accelerator/Catalyst guidelines for details.

Part B component resin should then be added and mixed thoroughly at slow speed for a minimum of 60 seconds until uniform.

How to mix the Resin and Catalyst Guidance (continued)

CURE SPEED MODIFICATION

Accelerator/Catalyst should be used for temperatures below 15°C (especially note overnight temperatures) as this can lead to longer curing times and contamination of the surfacing. An accelerator/Catalyst should be used with each mix to ensure uniformity of cure except for higher consistent temperatures of 25°C.

Ambient Temperature °C	Addition to Part A of a 7/7.5kg kit
13-16	11ml
9-12	25ml
5-8	37ml

The surface should be allowed to cure for approximately 8 hours, but we do not recommend foot traffic for at least 24 hours. This will be longer if the temperature is lower. At low temperatures, Accelerator/Catalyst can be added to maintain cure speed.

Installation advice

THE IMPACT OF HEAT AND MOISTURE ON YOUR INSTALLATION

There are many factors which can influence the success of a resin-bound installation – but the major cause of product failures are due to issues concerning heat and/or moisture.

To understand why we want to briefly describe how the resin product works – and we hope this helps emphasise the importance of following the recommended procedures closely.

THE IMPACT OF HEAT

The resin hardens (permanently cures) due to a chemical reaction known as Thermosetting. Thermosetting uses heat and there are several external and internal factors which can increase/decrease the amount of heat generated, thereby affecting the curing speed of the product.

THESE FACTORS ARE:

External Factors:

- Air Temperature
- Ground Temperature
- Stored Temperature of Stone/Resins

Internal Factors:

- Time taken to mix
- Time in mixer
- Time taken to trowel

Installation advice (continued)

THE IMPACT OF MOISTURE

For years, the installation guidelines for resin bound were: 5°C and rising and no rain! However much more has been learned – often the hard way - about the no.1 enemy of perfect Resin Bound installations – moisture.

Excess moisture reacts with Isocyanate (Resin Hardener) to produce amines and a bi-product of Carbon Dioxide. Trapped bubbles of Carbon Dioxide create a white 'bloom' on the surface which is typically only visible when dry.

It should never be the intention to install during wet conditions (including Snow) or when rain is forecast or on wet surfaces.

You should ensure there is a long enough window of dry weather to allow substantial curing of the material before the chance of rain as the presence of water on uncured resin will weaken it and reduce durability.

IMPORTANT CHECKS BEFORE YOU START INSTALLING

Temperature plays an important role in deciding whether to proceed with an installation. 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 of 10°C to 30°C.

A hygrothemometer should be used to measure the air temperature and relative humidity.

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Mixing DALTEX UVR Resin and DALTEX Aggregates

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.

Check that the mixer is clean and its paddles are adjusted correctly and all safety guards are fitted.

Start the mixer. Check it is operating correctly and safety interlocks are working.

STAGE 1 - Ensure the aggregates are mixed consistently for all mixes. (Mixing dry stone can grind the stone and introduce dust or grind contaminants to the drum walls).

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 stopwatch to ensure consistency for every mix.

It should take no longer than 4 minutes once the resin has been added. Once the sand has been added, ensure it has been distributed evenly through the mix. Ensure there are no dry areas of aggregate and no clumps of resin-rich aggregate.

Mixing DALTEX UVR Resin and DALTEX Aggregates (continued)

Switch the mixer off and empty the mix into your lined barrow and take it to the point of installation.

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 the 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.

Trowelling the Perfect Finish

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

You 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.

In order to knit the mix together, 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 from digging into the mix.

You must trowel the mix until all the aggregates stop moving in a fluid movement and become solid. Once levelled and compacted, the surface can be smoothed (polished).

Mixing DALTEX UVR Resin and DALTEX Aggregates (continued)

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.

To create a non-slip surface the top can be scattered with glass grit. Application rates vary depending on the aggregate used but it is in the range of 50g-100g/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.

Ensure that the work area is completely clean and tidy and all waste has been disposed of correctly.

Health and Safety

The Management of Health and Safety at Work Regulations requires employers and self-employed persons to make a suitable and sufficient assessments of the risks to workers and any others who may be affected by their undertaking and record the significant findings.

Alternatively, the HSE website offers guidance booklets that are free to download. The link to their website can be found below. They also offer a newsletter that is free to sign up to.

www.hse.gov.uk/guidance

- 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. Use Rigger, disposable gloves and PVC gloves (conforming to EN388)
- Eyes should be protected from splashes and from stones flying out of the mixer with the use of safety goggles (approved to EN166IF)
- All operatives should wear overalls.
- High visibility clothing is advisable; either a vest or jacket (comforming to EN471/ENV343)
- 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 is 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 spirits are advised for cleaning floats and other hand tools.

It is important everyone works safely and we advise all site personnel to be trained in basic health and safety awareness. Always ensure your First Aid Kits are available and completely stocked.

Familiarise yourself with COSSH sheets and know what action to take in the event of an accident.

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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, lay and finished at the correct depth and return the following day to complete. A 'day joint' is likely to be visible.

If it rains:

3 mixes or less down?	Layer out to 10mm and return when dry
50% of job done?	Follow 'day joint' procedures
3 mixes or less to finish?	Follow 'day joint' procedures
OR	Ensure stone and mixing is kept dry – continue*

*Only on permeable bases. Important factor is to keep mixes and stone dry whilst being prepared. Still carries risk.

TOP TIP

Good quality systems have reasonable moisture tolerance but the systems should not be laid in rain.

Options above are a site decision based on how heavy and prolonged the rain is and the experience of the contractor.

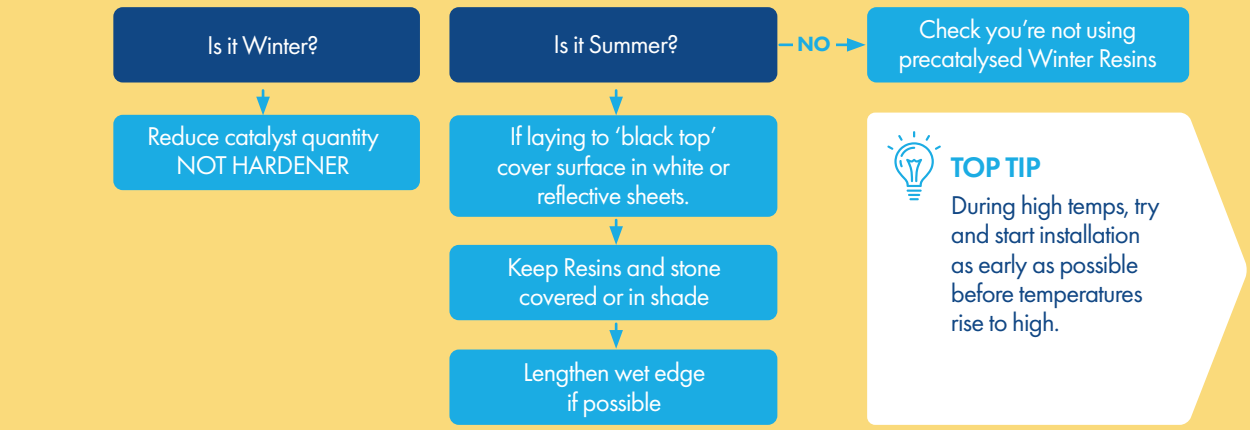
Avoiding Costly Mistakes (continued)

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 them 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.

System curing too fast (typically high summer):

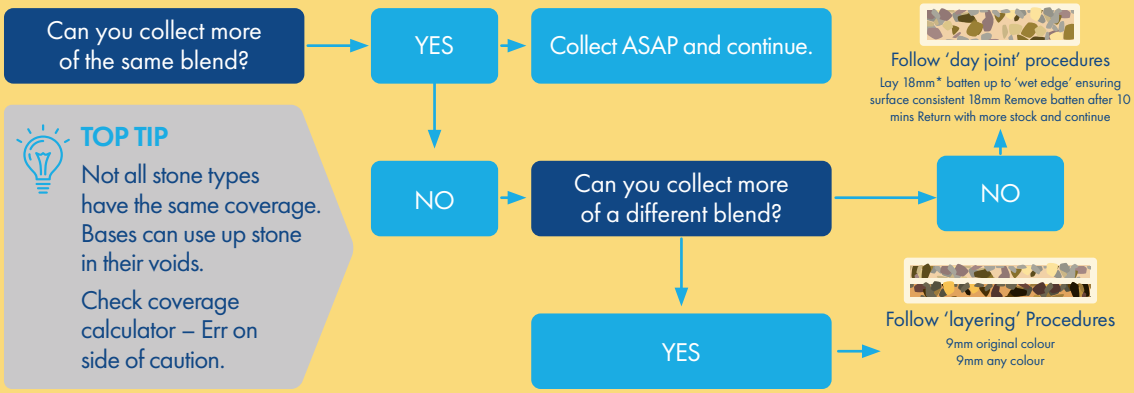


Avoiding Costly Mistakes (continued)

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.

If you run out of stock:



TOP TIP

Not all stone types have the same coverage. Bases can use up stone in their voids.

Check coverage calculator – Err on side of caution.

Avoiding Costly Mistakes (continued)

SURFACE SHADING

This cannot be rectified after the resin has been 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 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 the 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.

UNSTABLE BASES

Cracks can be caused by unstable bases or by ground movement, which is caused by the natural movement of the substrate. This is typically due to clay soils expanding and contracting in the presence of moisture (or lack of it).

Ensure that you have clear terms and conditions regarding ground movement. If the base has moved and you have installed the base, you will have to repair it. 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 (Heavy clay soils are vulnerable to movement through shrinking and expansion). Follow the crack repair procedure.

Avoiding Costly Mistakes (continued)

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

Iron staining is not always caused by iron in the stone. The mixing process grinds iron particles from paddles/drums into the mix and iron staining can become visible as the surface resin layer wears and exposes the iron particles to water. This can be treated with 'Rustaway' (oxalic acid).

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.

RESIN REACTS TO MOISTURE CAUSING 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 85%. Use a Hygrometer if in doubt. Blooming is not usually visible during wet weather.

In terms of remedial action: you can try to clean the surface with WB128/40 water-based primer (short pile roller). This treatment may work however the only alternative is the removal of the surface and reinstatement (or overlay) - so prevention is paramount!

Avoiding Costly Mistakes (continued)

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.

EDGE SEPARATION

Ground movement can cause edge retraction. Stepped haunches and priming inside edges of blocks can reduce the risk. Follow the crack repair procedure.

CATALYST:

Missing catalyst: If you fail to add a catalyst into a batch, the material will not cure, or at best, cure very slowly depending on the ambient temperature.

Too Little Catalyst: Adding too little Catalyst will slow the rate of the cure down which can leave the material vulnerable to changes in weather and mechanical damage.

Too Much Catalyst: Adding too much Catalyst will increase the rate of the cure which can lead to difficulty merging with previous batches and visible batch lines appearing.

Burnishing: Over-floating/trowelling an area can lead to a dark area in the surface where the metal from the float/trowel is rubbed off onto the top of each aggregate particle.

Resin on Blocks: Avoid staining of block edging by taping up and making surrounding blocks before any work commences.

Slippery surface: All DALTEX Bespoke blends meet national slip resistance requirements however not applying the glass grit correctly over the surface can make the surface appear more slippery.

Inadequate depths: Ensure the correct depth of material is used throughout the Project. Inadequate depths can cause early failure.

FAQs

What depth should I install it at?

We recommend that for driveways a minimum depth of 18mm is used. For foot traffic and pathways, 15mm may be used, however, we highly recommend all installations are applied at a minimum depth of 18mm to ensure the aggregate is knit consistently.

What is the maximum temperature I can install at?

Installations should not proceed if the operating temperature, road surface temperature and/or air temperature is outside the range of 10°C to 30°C.

Can I install on onto a compacted MOT?

We don't recommend it. There will be a risk of movement in the sub-base which could lead to reflective cracking in the future.

What is the minimum temperature for an installation?

A catalyst must be used for temperatures below 15°C (especially note overnight temperatures). The recommended minimum temperature for an installation is 10°C. Be aware of differences in ground temperature compared to air temperature and the impact of sun/shade on installation surfaces.

Is there something I can use to slow the resin down?

No, there is nothing available to slow down the curing time of the resin.

What sub-base should I use?

Resin Bound is SUDS compliant (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.

FAQs (continued)

Is it OK to install it on concrete? It won't be permeable?

Installations can be made on concrete but suitable soakaways and drainage should be considered. Please note this will not be SUDS compliant.

How much working time will I get with Resin Bound?

This varies with the working temperatures and humidity. However, with the correct amount of catalyst used, 30 - 40 minutes per mix is normal.

How much catalyst should I use per mix?

The amount of catalyst varies according to the temperature. Tables are provided on the catalyst bottle which shows the ml to be added based on the conditions.

What is the least amount of time I can get away from leaving the Resin Bound before it rains?

Rain and resins do not mix well. It is highly likely that the surface can be damaged should it rain during or shortly after the installation (minimum 4 hours). Accept the fact that if you have been caught in the rain, it is likely you will have to relay the surface.

What edging can I use?

Resin-bound paving can be laid up against almost any type of edging such as brick pavers, timber edging, Stainless Steel or Aluminium edging, lawn edging or directly up against walls.

Do I need to protect the edging?

It is essential to mask all edging to remove the risk of staining from DALTEX resin or other materials.

FAQs (continued)

What happens if I don't mix DALTEX UVR Resin and DALTEX Bespoke aggregates correctly?

If the aggregate particles are not coated evenly then early failure of the product can result. There is also a risk of a build-up of resin and fine aggregates which can cause foaming of the resin producing a whitening appearance and blisters on the cured surface.

Is there a shelf life on DALTEX UVR resin if not used immediately?

Providing the material is stored in a cool, dry place then the kit will last for up to one year. We do however recommend that whenever possible, resin from the same batch is used on a project.

What happens when I can't finish the Project in one day?

It is normally necessary to install a day joint if the project lasts longer than a day. This can be done by temporarily forming a neat edge at the intended place for the joint using a timber batten which can then be removed and fresh material laid against the previous installation the following day. A permanent edge can be made using aluminium square edge profiles which are available from The One Stop Resin Shop.

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