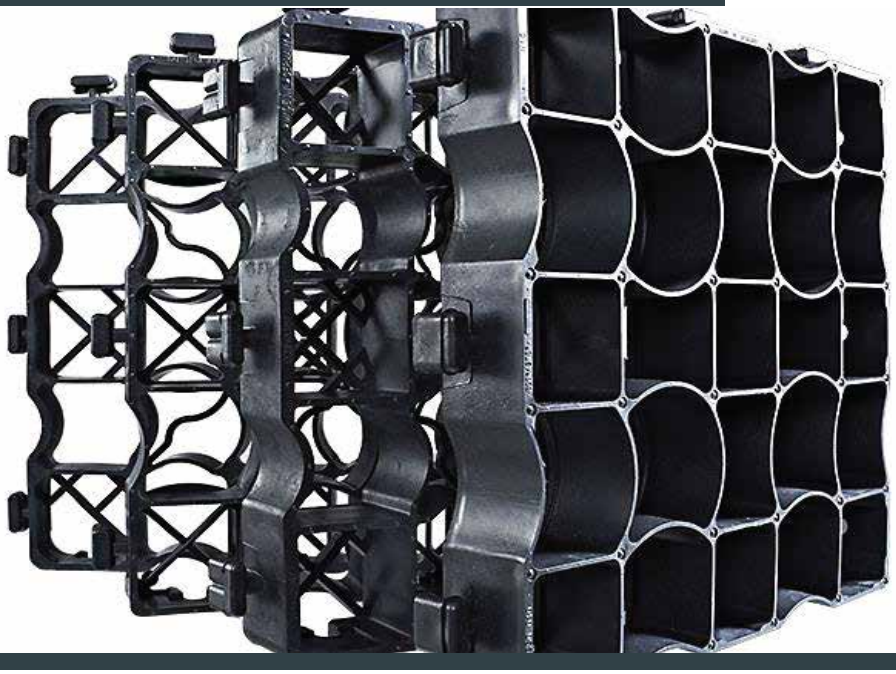
START TRAFFIC

Resin Bound Stone Installation Guide

Resin Bound Stone Guide: What is it?



Resin bound stone…so what is it?

Resin bound stone is a new and effective way of providing a highly aesthetic surface for your home or business premises. It can be installed internally or externally to provide a surface that is both very robust and load bearing, but also fully permeable. This means that any water that hits the surface will freely drain through the resin bound topping and through the EcoGrid base system to naturally dissipate into the water table.

These types of surfaces have an obvious advantage in current times as they are free draining and therefore effectively add to flood risk prevention. A resin bound surface is SuDS compliant and requires no planning permission; an important fact: surface water regulations 2008.

Resin bound stone should not be confused with resin bonded stone. Bound means in simple terms, that the pieces of aggregates are firmly adhered together with a highly robust bonding system which has 20% voids, thus allowing water and detritus to pass freely through. In the past, resin bound stone was coated over a variety of sub-bases such as porous asphalt or open grade tarmac. Whereas these are perfectly acceptable sub-bases, they are not very environmentally friendly, leaching pollutants in to the water table, are time consuming to lay, require clement weather, are costly, require a different skill set to install and a different range of equipment.

The EcoGrid system employs patented EcoGrid as the permeable, load bearing base. This is a product that is made from 100% recycled materials and has a load bearing capability up to 800 tonnes per square metre. The grids carry a patented locking mechanism that is unique to this product and ensures that once the grid is locked in place, it stays in place. The grid system has a low surface area of exposed plastic, allowing a strong bond between the stone infill and the resin bound surface. EcoGrid is also made from low density polyethylene which is compatible to the expansion rates of the resin surfacing whereas other plastics such as polyethylene are not and can produce cracking to the surface.

At EcoGrid, we offer a complete system, delivered direct to site. In the following pages, we will explain all of the constituent parts.

The geotextile layer

Mechanical Properties	Test	Unit	EG80 EcoGrid Approved
Tensile Strength – MD	EN ISO 10319	kN/m	6.0
Tensile Strength – XD	EN ISO 10319	kN/m	6.0
Elongation at Break – MD	EN ISO 10319	%	40
Elongation at Break – XD	EN ISO 10319	%	40
CBR Puncture Resistance	EN ISO 12236	N	1000
Dynamic Cone Drop	EN 918	mm	40.0
Protection Efficiency	WI 189066	N	48.0
Hydraulic Properties			
Permeability	EN ISO 11058	m/s	130×10^{-3}
Waterflow Normal to the Plane	EN ISO 11058	$l/m^2.s$	120
Waterflow in the Plane	EN ISO 12958	m^2/s	1×10^{-7}
Characteristic Opening Size	EN ISO 12956	µm	155.0
Physical Properties			
Thickness Under 2kPa	EN 964/1	mm	0.8
Weight	EN 965	g/m^2	80.0
Roll Width		m	4.50
Roll Length		m	100

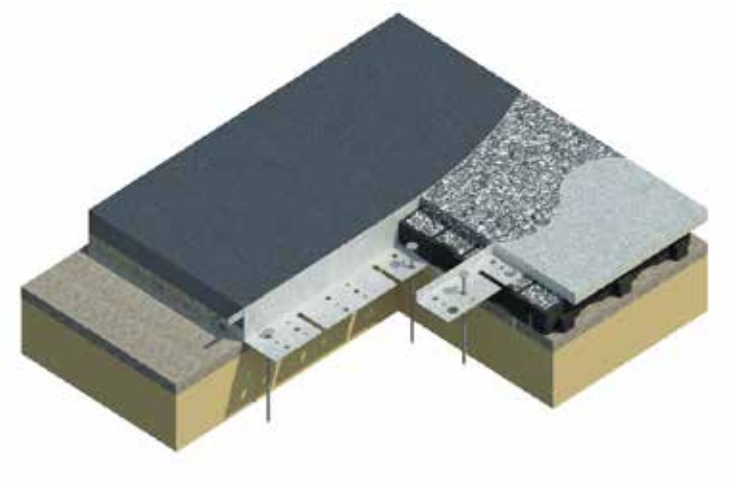
EcoGrid EG80 provides a separation layer between the sub-base, the screed layer and the EcoGrid permeable load bearing layer. A separation layer is necessarry in stopping the migration of sub-base stone to the surface layer, to act as a support layer for load dissipation and to act as a filtration layer, halting the migration of hydrocarbons to the water table. EcoGrid EG80 is sold in roll form :

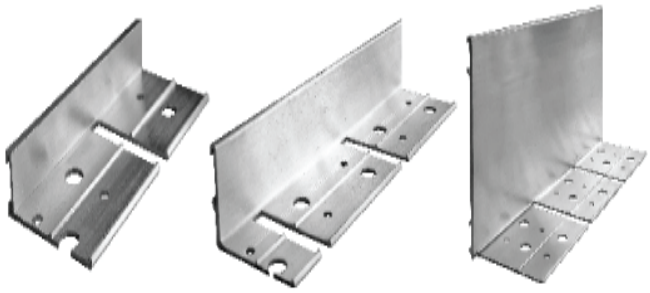
1.125 x 100 metres
2.25 x 100 metres
4.5 x 100 metres

Want a different Geotextile? No Problem, Just ask!

Also available in cut form (additional costs) in square metre quantiies of any amount.

Aluflex Aluminium Edging





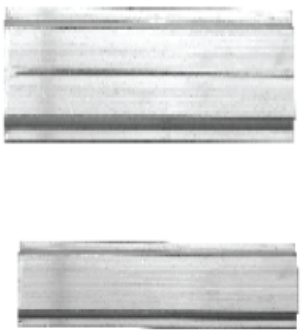
Name	AluFlex 19	AluFlex 64	AluFlex 76	AluFlex 150
Dims (mm) (H/W)	19 x 59	64 x 57	76 X 76	150 X 76
Thickness (mm)	1.8	3.5	3.5	4.0
Weight (KG/m)	0.37	0.8	1.00	1.72
Length (mm)	2000	2000	2000	2000

Can be fitted under the EcoGrid or along side. Curves both ways easily.

The EcoGrid Aluflex Aluminium edging system in 2 metre lengths which come complete with length joints and earth nails. EcoGrid Aluflex Aluminium edge system is ideal for:

• Resin bound stone installations that need a sturdy, aesthetic and load bearing single edge profile, this would be the Aluflex 64mm edge.
• The 19mm edge sits on the EcoGrid permeable base system for resin bound stone to create patterns and shapes. Pinned to the base and through the sub-base for a sturdy fit.

The EcoGrid Aluflex system is easy to fit and provides a professional finish to any Ecogrid installation or as a standalone.
product. The edge comes in lengths of 2 metres (other lengths are available on special order.) Each length is joined to the next with an Aluflex Aluminium jointer which slots in to the back of the lengths creating seamless profiles. The Ecogrid Aluflex edge can be fitted under EcoGrid permeable grids or outside



EcoGrid

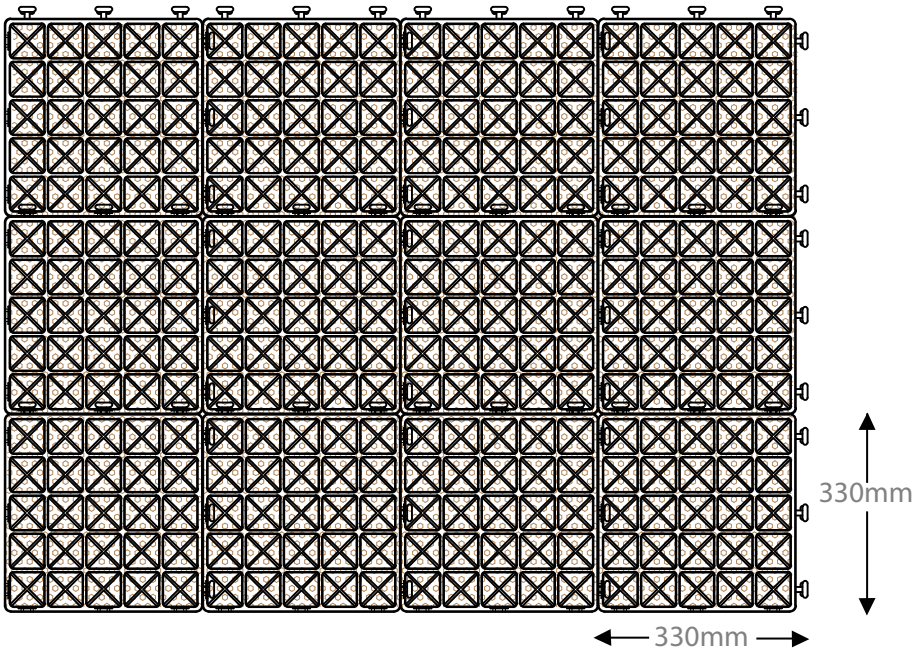
The EcoGrid system employs patented EcoGrid as the permeable, load bearing base. This is a product that is made from completely recycled materials and has a load bearing capability up to 800 tonnes per square metre. The grids carry a patented locking mechanism that is unique to this product and ensures that once the grid is locked in place, it stays in place. The grid system has a low surface area of exposed plastic, allowing a strong bond between the stone infill and the resin bound surface. Excavation can be from as little as 180mm for standard vehicle domestic applications meaning that there are several inherent advantages:

- Less excavation therefore less waste to landfill and quicker preparation
- Less requirement for hard-core
- Swift installation of the entire base system at 100 metres per man per hour
- No downtime due to inclement weather as the base can be laid in the wet
- No inconvenience to clients as the grids are immediately load bearing

- A type 3 reduced fines or clean sharp angular stone hard-core base to ensure maximum permeability and strength is laid to required depths (generally 60-100mm for domestic driveways).
- A membrane layer is laid on the top of the hard-core layer, this stabilises the ground, stops weed growth, stops the migration of the sub-base and acts as an important hydrocarbon infiltration layer.
- A thin (10-20mm) sharp sand or fine clean stone screed is laid on the membrane to 'bed in' the grids.
- The grids are laid and cut to shape if required, curves are put in place with our unique Aluflex Aluminium edge system with joints as required and pinned firmly in place around the perimeter.
- The grids are filled with the same stone as the screed layer.
- The EcoGrid resin system is mixed in an industry standard force mixer and then floated over the top of the filled grid. Our resin is fully UV stable. Our resin needs no activator and is stronger than most; you get a ratio of resin to aggregate of 7.5KG to 125 KG (5 x 25kg bags) of dried aggregate and sand mix. This ratio of resin to stone allows for more cost-effective installations, since up to 16% less aggregate is required for standard installations.

Just want the grids and nothing else this time? No problem!

EcoGrid arrives on-site in sheets of 12 grids pre-locked with our patentended system



EcoGrid

Just want the Aluflex edge? No Problem, Just ask!

- Quick and easy to install (about 100 m² per person per hour) because it is lightweight (approx. 5 - 11 kg/m² depending on type)
- Low transport and handling costs
- High load capacity (up to 800 t/m² filled)
- Safety locking system
- Surface reinforcement with natural drainage
- Extremely versatile thanks to additional components like slope angles, curve pieces, parking space markers
- Minimises maintenance
- Non-slip and crackproof
- Weatherproof and environmentally friendly
- Resistant to frost and UV radiation
- Easy to fit to borders or cut to shape

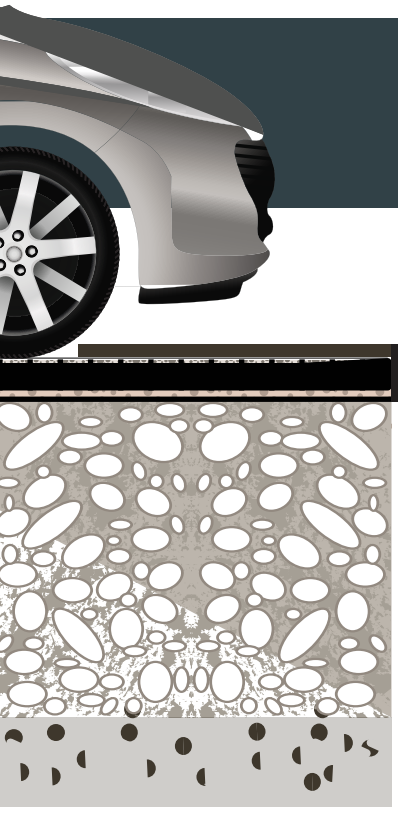
Determining how much sharp angular stone you need

Before determining how much broken stone you will need you should specify exactly the finished surface height. With larger installations, a laser level should be used

Grid fill can be calculated as follows:
0.95 x area x grid height

If you do not build a base layer, surface drainage cannot be assured, not only that, movement in the natural soil could cause unevenness. EcoGrid significantly increases the load capacity of the surface, but it goes without saying that even EcoGrid will be tested to it's limits if the entire sub-base gives way extensivly.

Example: driveway



EcoGrid resin bound stone 20mm layer ®
EcoGrid Aluflex edge system
Base or screed Layer
2-3 cm compacted
Filling Material on top of:
110g geotextile membrane

Draining layer
10-20 cm compacted free draining

Foundation

Floated over the top of the filled grid, edged with Ecogrid edging
Fill in the grid 4-10mm sharp angular stone

Levelling course
Put on a layer of 2/5 mm chippings (height approx. 2 cm) and level off.

Drainage layer
Put on broken stone grain size 5/32 mm or similar and compact (roller or plate vibrator see CBR chart)
Height of broken stone for cars: approx. 25 cm
Height of broken stone for lorries: approx. 45 cm

Natural soil
Create an approx. 1 - 1,5 % gradient in the ground

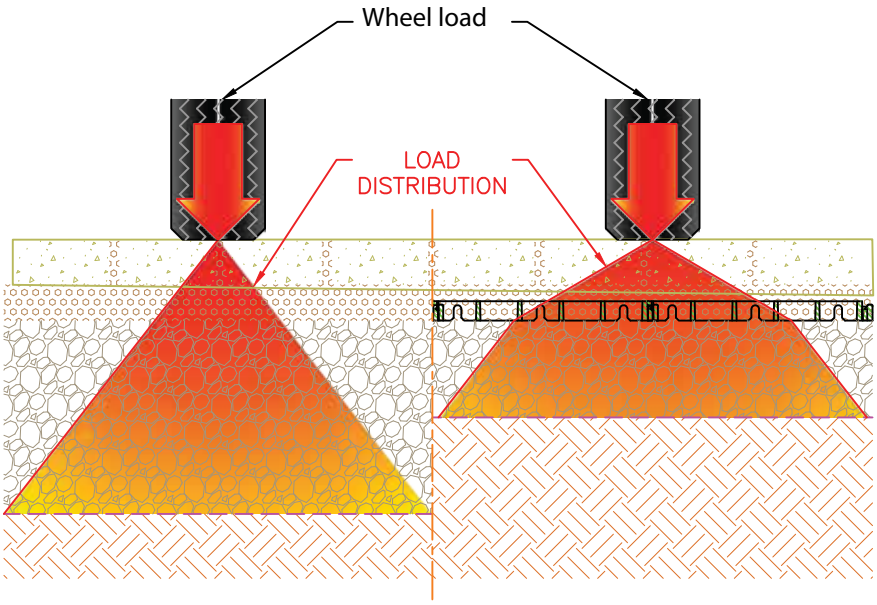
EcoGrid

- Prepare The EcoGrid surface (do not infill)
- Prepare curves where appropriate, remove extranious lugs
- Affix edges giving a 20mm riser above grid level, prepare shapes.
- Infill grids and compact to 2mm below surface level
- Mix 2 part resin thoroughly with a drill and paddle attachment
- Prepare resin and stone quantities to advised quantities
- Mix batches in a force mixer
- Tip on to EcoGrid and rake level in 3 square metre sections
- Float the surface to an even depth using edges as a guide
- Ensure expansion joints are in-place (min 15mm)
- Allow to cure (allow 24 hours for full curing process)

E30: Pedestrian traffic footpaths and light use

E40: Cars, vans and general duties

E50: Heavier Traffic sub-base and resin will need adjusting

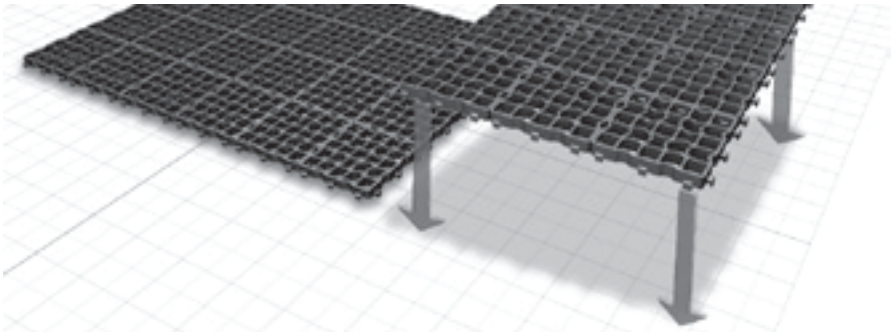


A lot of our clients want to use their trusted supplier of resin and stone We don't mind ! With the stone, just make sure it is clean, dry and the right size for your job.

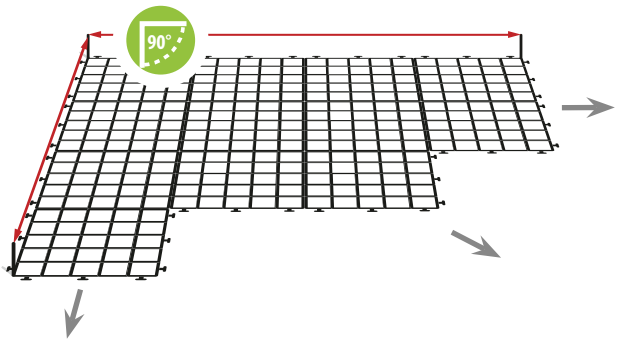
EcoGrid curving pieces for continuous curves without cutting

EcoGrid

EcoGrid is supplied in palletised form. The maximum that you can get on a pallet is 69 square metres of our 40mm grid and 57 square metres of 50mm grids. The grids arrive pre-connected in rows of 1.33 square metres or 12 grids making fitting swift and simple. You don't have to buy a full pallet.



EcoGrid is easy to lay without the need for machinary. The system is delivered in pre-connected rows of 12 grids or 1.33 square metres. Rows can easily be lifted from the pallet by one person, laid on to the prepared ground, the next row is swiftly and securely clipped in to place ensuring a securely locked surface.



Installing

To lay the grids, start in one corner of the area. The lugs of the first row must point in the direction you are working in. The subsequentrows are then pressed into the lugs of the laid surface. We recomend to use a plumb line when installing

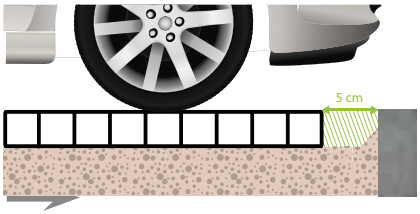
Disconnecting

The preconnected sheets can be taken apart if necessary. Lay the sheet you wish to take apart on another sheet and, using your foot, press the tiles you want to remove down and out of the safety locking system.

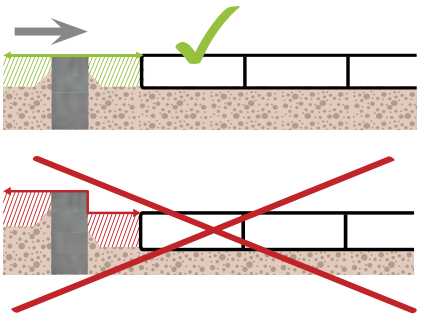
Fitting – cutting to size

For quick and clean tile cutting, the following tools have proven to be the most effective

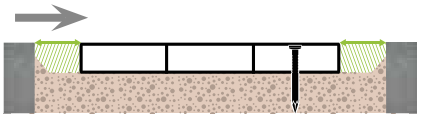
. Angle grinder with stone or diamond blade
. Circular saw
. Hand saw



When installing grids or resin bound stone, ensure expansion joints are in-place, these can be filled with loose aggregate. 3-5mm



EcoGrid resin bound system should be installed level to edges



To avoid surface distortion at the edges caused by the shear force of cars. EcoGrid can be fixed with ground anchors at the rear end of the parking area

* Direction of travel from left to right

CBR ratings guide: Use this to ascertain the amount of sub-base you will require

Field guidance for estimating sub-grade strengths					
Consistency	Indicator			Strength	
	Tactile(feel)	Visual (Observation)	Mechanical (Test)	CBR	CU
			SPT	%	KN/SQM
Very soft	Hand sample squeezes through fingers	Man standing will sink>75mm	<2	<1	<25
Soft	Easily moulded by finger pressure	Man walking sinks 50-70mm	2-4	Around 1	Around 25
Medium	Moulded by moderate finger pressure	Man walking sinks 25mm	4.8	1-2	25-40
Firm	Moulded by strong finger pressure	Utility truck ruts 10-25mm	8-15	2-4	40-75
Stiff	Cannot be moulded but can be indented by thumb		15-30	4-6	75-150

Application Load	CBR % strength of subgrade soil	DoT sub-base thickness (mm)
Fire trucks, coaches and occasional HGV access	>6 =4<6 =2<4 =1<2	100 120 190 380
Light vehicle access and overspill car parking	>6 =4>6 =2<4 =1<2	100 100 135 260

Resin

The EcoGrid resin for your resin bound application is an Aliphatic resin. Aliphatic resin is a UV stable clear polyurethane resin for all applications and is not affected by the sunlight, great at keeping it's appearance and showing the aggregates to their best effect. Although more expensive it will not fade and can be refreshed with a clear coat of resin at any time.

The resin comes as a two-part kit, this is mixed in a force mixer 100 kg of aggregate and 6 kg of kiln dried sand to one kit of resin. If you are laying to the advised 20mm depth of surface, this full kit will give you approximately 3 square metres coverage although always err on the side of caution and allow for more materials than you think you will need.

Sand optional for non-slip applications

Our resin is fully UV stable and does not go milky in time

Aggregate

Brittany Bronze 2-5mm

Black 2-5mm*

Silver 2-5mm*

Brittany Bronze 10mm

Golden Quartz 2-5mm

White Flint 2-5mm

Autumn Quartz 2-5mm*

Green 2-5mm

Staff Pink 2-5mm

Beige 2-5mm**

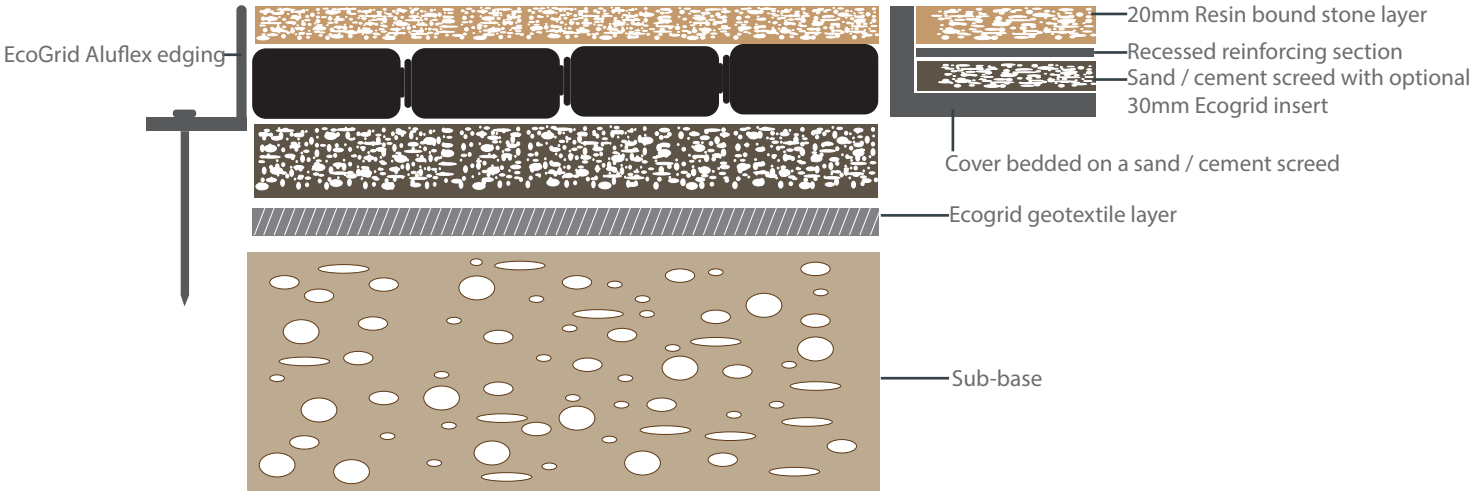
Red 2-5mm

Yellow 1-4mm

*- additional £1.50 per metre | ** Additional £5 per metre - more colour mixes available on request

Recessed covers

A perfect cover for resin bound stone applications, seamlessly blending with the EcoGrid Aluflex Aluminium edge
Available in 50mm and 60mm depths, both double and triple sealed versions. Available in all sizes from 300mm x 300mm to 1000mm to 1000mm



Our DS-Line-60 cover has a height of 60mm overall making it simple to select the right recess. An odour and waterpoorf aluminium cover that's self secured to the outer frame, featuring two seals: one at the base and a "T-rubber" seal built-in to the side of the outer frame.

The unique "T-rubber" seal allows for an additional odour barrier, elasticity to avoid tension between the recessed cover and frame, and the prevention of dirt between the cover and frame. Perfect for exterior applications.

Additional info. & properties

- Extruded aluminium frame & cover
- Easy to open with lifting keys provided
- Application: exterior
- The cover is odour and waterproof
- The cover is not screw tight (locked)
- Featuring a high-grade EPDM seal with "T-rubber" seal on side of frame
- Standard equipped recess cover with reinforcement mesh
- Bottom plate made of a 3mm galvanised steel plate (on request)

For further information or help choosing the right grid for your needs, contact our sales team on 01905 794 875. They will be happy to help you pick the right ground protection system for your needs. Alternatively email our sales team on sales@starttraffic.uk with your enquirires and they will get back to you with a reply as soon as they can.