ROADFILL

+4420 3930 3228
The Epicentre
Haverhill Research Park
Haverhill, CB9 7LR
www.roadfill.co.uk

ROAD

ROADFILL

ROADFILL

Crash. Press. Roll.

By using recycled plastic waste products, we are all contributing to a reduction in landfill, effectively removing more plastic waste which in turn is reducing carbon footprint and our reliance on fossil fuels.

ROADFILL

Bad boys

not allowed

Roadworx®

By adding our Roadworx® recycled plastic products, it substitutes the amount of bitumen needed to repair or relay a road. The polymers add extra flexibility to the road surface and aids in the reduction of tyre fatigue which again is helping to reduce fossil fuel emissions.
Furthermore via our recycling process we significantly reduce our carbon footprint.

roadfill.co.uk

PLANET

Plastic additive for asphalt modification

Roadworx

is a recycled plastic product which is a specific blend of various plastics from the waste stream which is then after a unique process formed into a 2-3mm pellet for addition to asphalt or bitumen. Because the plastic is at the end of its service life it can be considered to be virtually carbon free. The only carbon cost is that included in the production and transportation of the pellet. Transportation costs are kept to a minimum by using a network of local recycling centres for the production of the pellets.

The use of plastic as an additive to asphalt material and bitumen is not new, especially as an additive into bitumen. EVA has been used as an additive since the 1980s and SBS and SBR are currently widely used to enhance the properties of bitumen.
However, all of these additives are virgin materials and while they enhance the properties of the asphalt, they have an adverse impact on the CO2 value of the finished product.

Road
worx
PRS

ROADFILL

Roadworx

UK Testing

The initial testing, which was undertaken in Greece, showed that an addition rate of 0.2% Roadworx plastic of the total mix resulted in a reduction in the binder demand of 0.5%. The results of this testing were used as the starting point for testing in the UK. Testing was undertaken in the UK by TRL and Surrey County Council on a Thin Surfacing Material. The Roadworx material, with a 0.5% reduction in binder and a control mix were subjected to Gyratory Compaction to assess the air voids from freshly mixed material to refusal density.

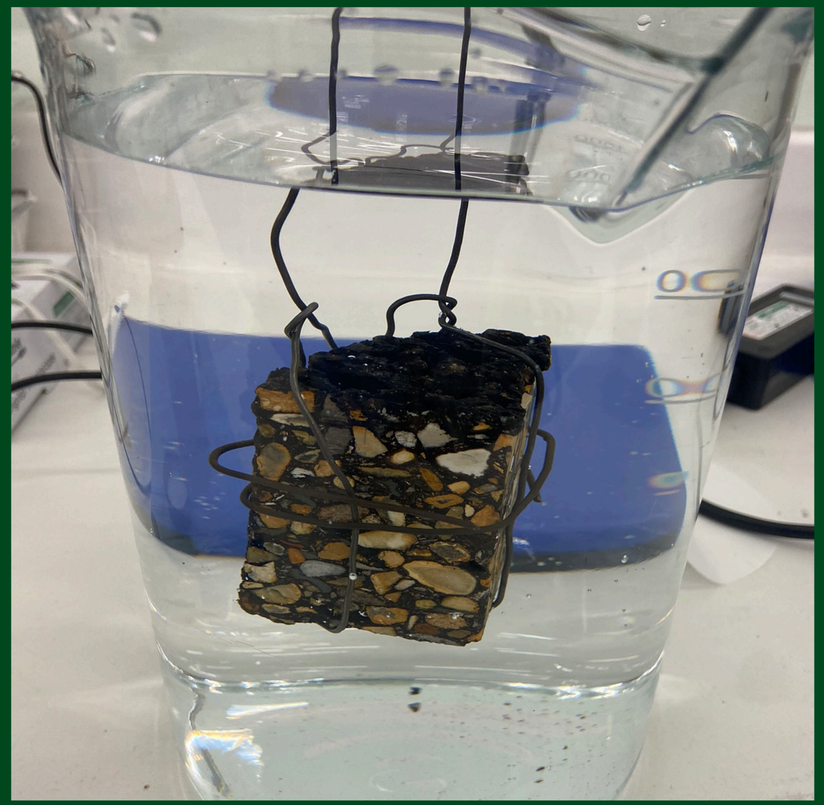
The air voids at 120 gyrations is equivalent to freshly laid and compacted material. Both materials were then subjected to Indirect Tensile Stiffness Testing (ITSM) before and after soaking, wheel track testing at 60°C, binder recovery and crack propagation The ITSM test gives a measure of the stiffening affect the plastic will have on the asphalt mixture and the wheel tack test shows how the asphalt will perform under heavy channelised traffic while the crack propagation indicates susceptibility to low temperature cracking.

TEST		CONTROL	ROADWORX
Indirect Tensile Stiffness Modulus MPa		3848	5435
Indirect Tensile Stiffness Modulus post soaking MPa		4283	5071
Recovered Binder Properties	Penetration d/mm	**45**	**44**
	Softening Point °C	**51.8**	**52.8**
Wheel Tracking 60°C	Wheel Tracking Slope mm/1000 cycles	**0.53**	**0.20**
	Proportional Rut Depth % 10,000 cycles	**21.01**	**12.40**
	Rut Depth mm at 10,000 cycles	**11.51**	**6.20**
Air Voids 120 gyrations equivalent to site compaction		**1.6**	**5.7**
Crack Propagation	Max Strength at failure N/mm^2	0.486	0.474
	Fracture toughness N/mm^2	3.0	2.9

ROADFILL

Roadworx

In the lab



ROADFILL

Roadworx

Conclusions

The testing undertaken so far on the Roadworx recycled plastic additive for asphalt shows that with

an addition rate of a min 0.2% the binder content of the asphalt can be reduced by min 0.5%.

Additionally the asphalt then performs at a similar level on some criteria and improves performance on other criteria.

This level of addition in a surface course material will result in the use of over 2 tonnes of recycled plastic in every mile of road surfaced.

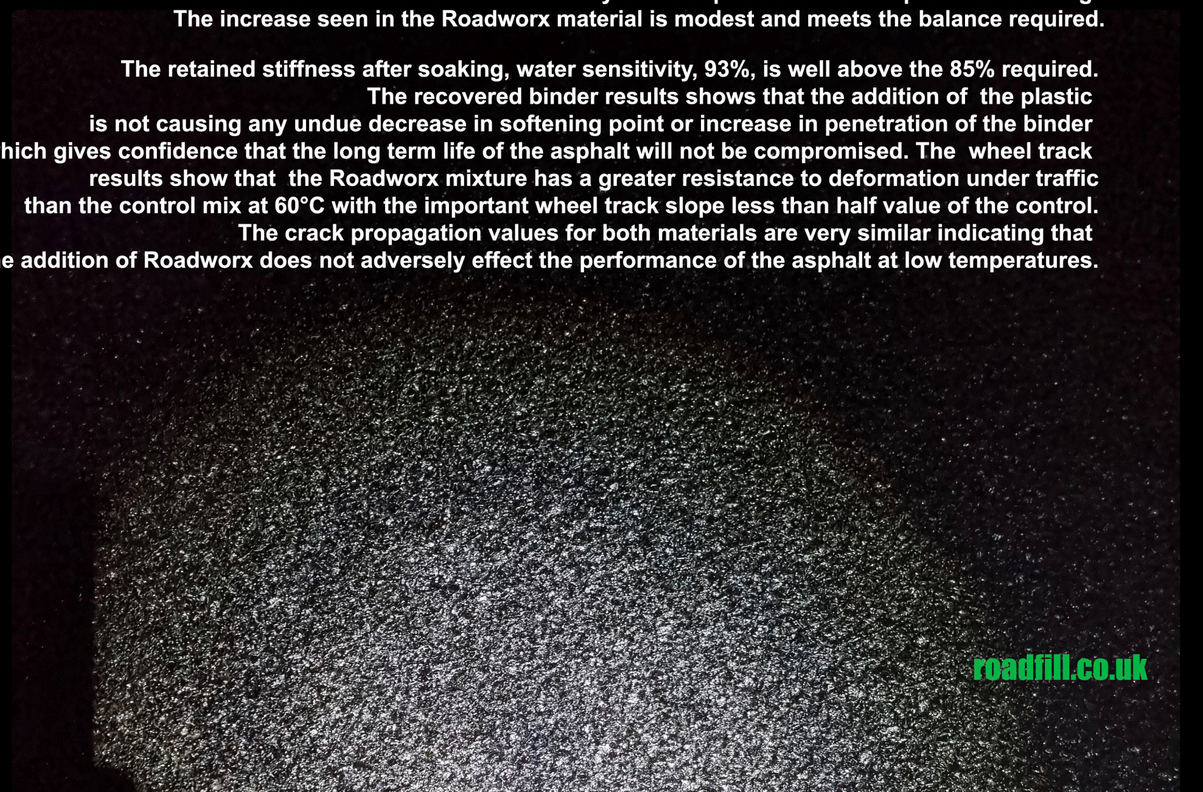
Roadworx

Results

The Gyratory compaction testing showed an increase in the air voids against the control mix at 120 gyrations which would be equivalent to the air voids that would be achieved after laying on site. It is important to have sufficient air voids in the asphalt material immediately after laying to prolong the life of the surface and to ensure that the bitumen will not be flushed to the surface when the road is subject to heavy traffic. The testing undertaken shows an increase in the air voids from a low value in the control mix to a more acceptable and expected level with Roadworx additive.

The ITSM testing showed that the stiffness of the asphalt increased by up to 25% when compared to the control mix. Stiffness of the mix is important when resisting the effects of heavy slow moving traffic but too stiff a material will remove the flexibility of the asphalt and make it prone to cracking. The increase seen in the Roadworx material is modest and meets the balance required.

The retained stiffness after soaking, water sensitivity, 93%, is well above the 85% required. The recovered binder results shows that the addition of the plastic is not causing any undue decrease in softening point or increase in penetration of the binder which gives confidence that the long term life of the asphalt will not be compromised. The wheel track results show that the Roadworx mixture has a greater resistance to deformation under traffic than the control mix at 60°C with the important wheel track slope less than half value of the control. The crack propagation values for both materials are very similar indicating that the addition of Roadworx does not adversely effect the performance of the asphalt at low temperatures.



roadfill.co.uk

A40 Applications

The A40
is a great example of Roadworx application
with an exceptional quality report.
This road is a great example
of innovative solutions
and carbon reduction in real life.

It is not a road, it is an A road
It is not a drive, it is a ROADFILL drive.

ROADFILL

Tayside Scotland, Greece, India, California are just some of our upcoming projects.
With great partners such as
BinnGroup, Vibraseeds, Uk universities, UK Graphene Centre, Cleantech and more,
Roadfill's presence is reassuring for our country's zero carbon target.

roadfill.co.uk

ROADFILL

our PEOPLE

It is not just about plastics and asphalt,
it is about balance, improvement, innovation.
It is about the people,the passion, the respect.
It is about finding a meaning in working hard,
about being ok to be different,
being ok to be new,
being ok to be young or old.
Being ok to be you.

That is what makes Roadfill different, our people.
The relationships they create with our clients.
The honesty and trust they inspire on each and every step.