Low Carbon Materials

ACLA®

CARBON NEGATIVE AGGREGATE TO ACHIEVE NET ZERO ASPHALT

THE EARTHSHOT PRIZE

Low Carbon Materials

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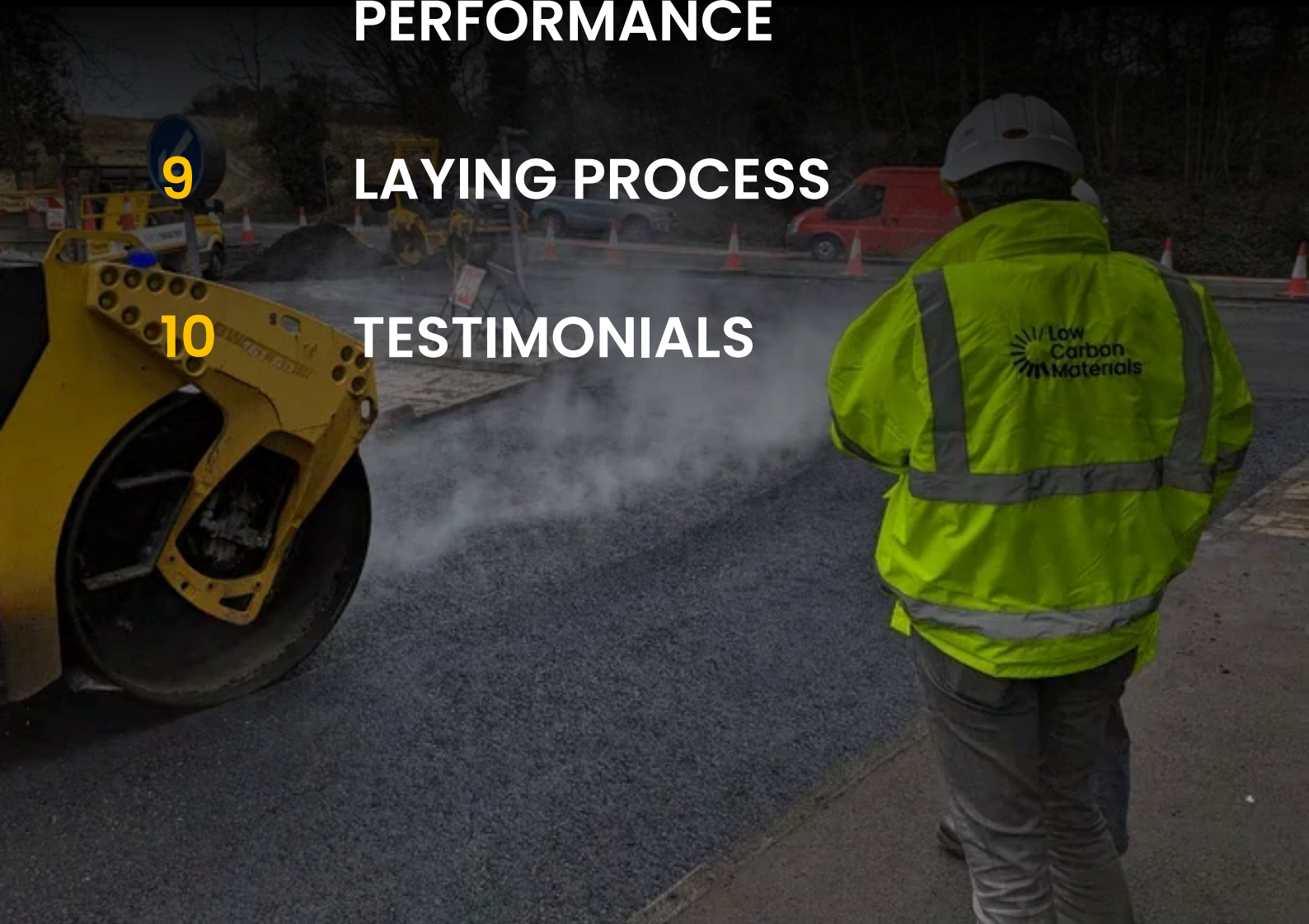


WHY USE ASPHALT CONTAINING ACLA® ?

Low Carbon Materials

Maintaining and building new asphalt roads is a carbon intensive process. In the UK alone, 25 million tonnes of asphalt is laid annually.

ACLA® offers a straightforward solution to significantly reduce these associated emissions.

Choosing asphalt products that contain ACLA® offers a simple and sustainable solution to decarbonise construction.

By using manufacturers that have incorporated ACLA® into their asphalt clients including local councils and National Highways have lowered the carbon footprint of their infrastructure projects across the UK.

SAME PROCESS. LOWER CARBON.

"ACLA OFFERS A SIMPLE AND SCALABLE SOLUTION THAT CAN BE READILY ADOPTED BY THE PUBLIC AND PRIVATE SECTOR IN THEIR PURSUIT OF THEIR NET ZERO TARGETS.'

Natasha Boulding
LCM CEO

ACLA® IS THE ONLY SOLUTION THAT CAN ACHIEVE NET ZERO ASPHALT ON ITS OWN

ACLA® enables a seamless transition to net-zero asphalt, working within established processes to maintain asphalt performance while achieving a significantly lower carbon footprint.

HOW TO ACHIEVE NET ZERO ASPHALT?

Low Carbon Materials

ACLA® is a carbon-negative aggregate which acts as a permanent carbon storage solution for the decarbonisation of asphalt.

1 tonne of ACLA® has permanently removed 798kg CO_2e from the atmosphere.

The Environmental Product Declaration (EPD) of ACLA® verifies GWP-TOTAL, A1-A3: -798 kg CO2e/T

This is a cradle to gate (A1-A3) carbon footprint value, meaning it has taken into account the carbon emissions and benefits associated with raw materials and the production of ACLA®.

ACLA® utilises the carbon removal technology of sequestration to permanently remove carbon dioxide from the atmosphere.

While ACLA® is uniquely capable of achieving net-zero asphalt independently, it is highly compatible and stackable with other carbon-reducing technologies such as bio-bitumen and RAP.

✓ EPD

PERMANENT CARBON REMOVAL SOLUTION

ACLA® offers opportunities for significant carbon reduction at various project scales. If the carbon target is a reduction of less than 100% then the ACLA inclusion amount can be tailored to achieve the desired reduction.

CASE STUDIES

LOCAL AUTHORITIES

Low Carbon Materials

Contractors and manufacturers across the UK have supplied net zero (or low carbon) asphalt to multiple local authorities, thereby significantly reducing the carbon footprint of highways resurfacing, through the incorporation of ACLA® into their asphalt mixes.

Local Authorities including Durham County Council, Redcar and Cleveland Borough Council, Central Bedfordshire Council, East Riding of Yorkshire Council, and London Borough of Redbridge Council have successfully deployed ACLA®, resulting in measurable reductions in carbon emissions.

These projects, which use ACLA® to create low-carbon or net-zero asphalt, have received significant recognition for their leadership. Durham County Council Highways Team won the County Durham Environment Awards' 'Responding to Climate Change' and Redbridge Borough Council received the International Green Apple Environment Award.

178,000 Kg CO_2e Removed

EQUIVALENT TO DRIVING A PETROL CAR 27 TIMES AROUND THE EARTH

"THIS NEW MATERIAL CONTINUES TO PLAY A KEY ROLE IN HELPING THE COUNCIL ACHIEVE ITS CARBON REDUCTION AMBITIONS AND, WHEN USED IN CONJUNCTION WITH OTHER SUSTAINABLE MATERIALS, ALLOWS THE DELIVERY OF ROAD MAINTENANCE PROJECTS WITH SIGNIFICANTLY LOWER EMISSIONS THAN WHEN USING STANDARD MATERIALS."

Alan Patrickson
Durham County Council's Corporate Director for Neighbourhoods and Climate Change

CASE STUDIES

NATIONAL HIGHWAYS

M11

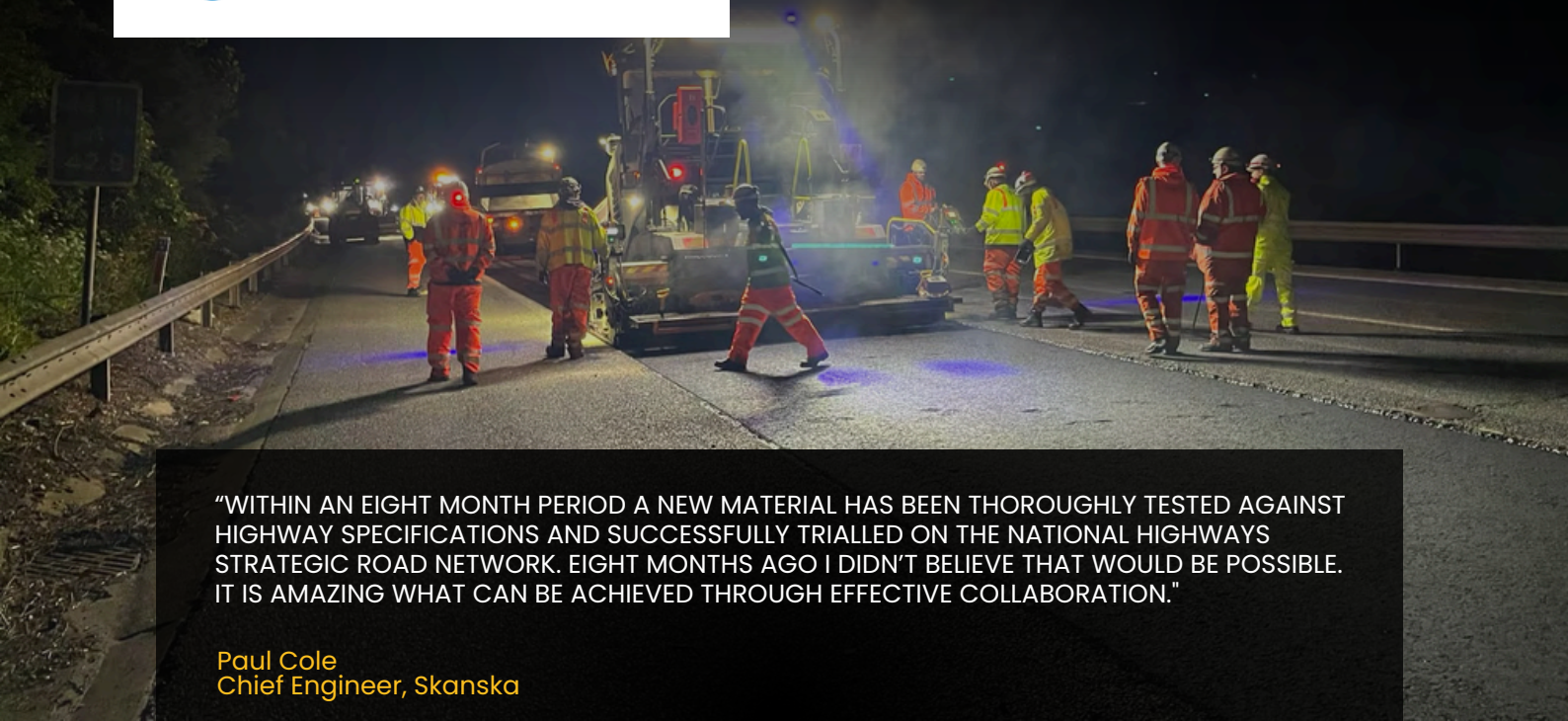
This was a huge milestone!

The M11 trial, a collaborative effort involving National Highways, Low Carbon Materials, Skanska, and Tarmac, demonstrated the successful application of ACLA® in real-world road resurfacing.

20 tonnes of net-zero binder course asphalt, incorporating ACLA®, was laid on a section of the M11 between junctions 7 and 8, with a patch of standard binder course asphalt laid alongside it for comparison.

The trial demonstrated that ACLA® can be handled and processed using standard asphalt plant equipment and techniques, requiring no additional equipment, procedural changes, or specialized training.

This innovative approach confirmed, to National Highways and the wider sector, the potential to significantly reduce carbon emissions from road construction, contributing to National Highways' goal of decarbonizing maintenance and construction by 2040.



"WITHIN AN EIGHT MONTH PERIOD A NEW MATERIAL HAS BEEN THOROUGHLY TESTED AGAINST HIGHWAY SPECIFICATIONS AND SUCCESSFULLY TRIALLED ON THE NATIONAL HIGHWAYS STRATEGIC ROAD NETWORK. EIGHT MONTHS AGO I DIDN'T BELIEVE THAT WOULD BE POSSIBLE. IT IS AMAZING WHAT CAN BE ACHIEVED THROUGH EFFECTIVE COLLABORATION."

Paul Cole
Chief Engineer, Skanska

CASE STUDIES

NATIONAL HIGHWAYS

A64

A cutting-edge trial on the A64 delivered the UK's lowest carbon resurfacing scheme on the strategic road network without using carbon offsetting.

Tarmac and National Highways, together with supply chain partners, successfully reduced carbon emissions on the project by 75 per cent compared to a traditional maintenance project of a similar scale, with over 260 tonnes of carbon savings delivered.

The trial was delivered on a 1.5 mile section of the A64 eastbound carriageway at junction 44 near Bramham in North Yorkshire. Over a seven-day period the team, including HW Martin, Premier Roadmarkings, Kier and Mway Comms, combined an extensive range of innovative low carbon materials, use of innovative paving technology and plant equipment to deliver the significant carbon savings.

As part of the trial a 150m section was laid in which ACLA® was utilised alongside other carbon reducing technologies, facilitating the landmark achievement of the UK's first Net Zero pavement.

"A NET ZERO BRITAIN WILL STILL TRAVEL BY ROAD, AND FINDING LOW CARBON WAYS TO MAINTAIN OUR ROAD NETWORK IS VITAL. NATIONAL HIGHWAYS' CARBON MANAGEMENT SYSTEM AND LOW CARBON OPPORTUNITIES REGISTER CAPTURE INNOVATIONS LIKE THOSE USED ON THIS PROJECT, WITH THE INTENTION TO MAKE THEM STANDARD PROCEDURE ACROSS THE ROAD NETWORK IN FUTURE."

Angela Halliwell, Head of Carbon and Air Quality Group
National Highways

PERFORMANCE TESTING

RESULTS FROM THE A64

As part of the A64 trial, extensive laboratory testing was completed. The data here shows a comparison of the AC20 binder course used throughout the project with the AC20 binder course containing ACLA®.

Material	Binder	RA Content	Production Temp	Comment
WARM BIO AC 20 DBM 40/60 DES	40/60 with Carbon Sink 375	40% no ACLA	Warm	Main use throughout the scheme.
	40/60 with Carbon Sink 375	40% 3% ACLA	Warm	150m zero carbon section.

The data provided by Tarmac demonstrates that the ACLA® containing mix is compliant with the asphalt material specifications outlined in "Clause 929 - Dense Base and Binder Course Asphalt Concrete (Design Mixtures)" of Specification for Highway Works 0900 Series.

One result of particular interest is the Indirect Tensile Strength Ratio (ITSR). This is an accelerated weathering test used to give an indication of the effect of water on long term performance.

The ratio of the indirect tensile strength of weathered samples compared to that of dry samples is expressed as a percentage.

A result of 95% is a very positive indicator for good long term performance.

	Reference >>>	WARM BIO AC 20 DBM 40/60 DES 24/0884	WARM BIO AC 20 DBM 40/60 DES + ACLA 24/0882
Grading	31.5	100	100
	20	96	98
	14	80	74
	10	69	59
	6.3	52	46
	4.0	42	37
	2.0	30	28
	0.5	18	18
	0.25	13	13
	0.063	7.0	6.6
Bitumen	Found B/C (%)	4.4	4.5
Voids	Refusal air voids (%)	0.7	0.5
	In situ gauge air voids (%)	3.9	3.1
Stiffness	ITSM (MPa)	9742	9996
Wheel tracking	WTS_{AIR}	0.05	0.05
	PRD (%)	4.1	3.7
Water sensitivity	ITSR (%)	86	95

THE RESULTS HIGHLIGHT NO DETRIMENTAL EFFECTS ON THE PERFORMANCE OF THE ASPHALT ON ACCOUNT OF THE INCLUSION OF ACLA®

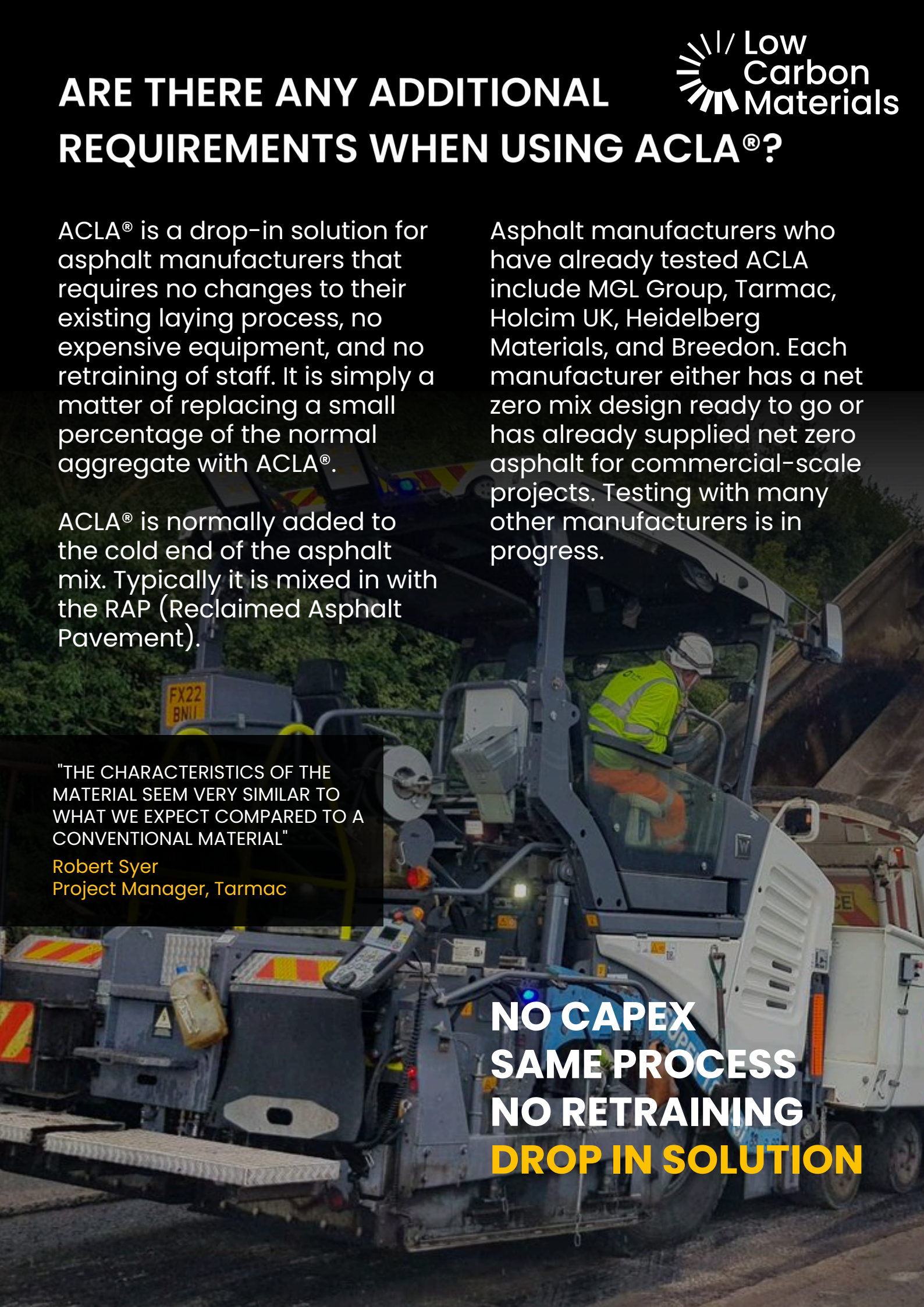
ARE THERE ANY ADDITIONAL REQUIREMENTS WHEN USING ACLA®?

Low Carbon Materials

ACLA® is a drop-in solution for asphalt manufacturers that requires no changes to their existing laying process, no expensive equipment, and no retraining of staff. It is simply a matter of replacing a small percentage of the normal aggregate with ACLA®.

ACLA® is normally added to the cold end of the asphalt mix. Typically it is mixed in with the RAP (Reclaimed Asphalt Pavement).

Asphalt manufacturers who have already tested ACLA include MGL Group, Tarmac, Holcim UK, Heidelberg Materials, and Breedon. Each manufacturer either has a net zero mix design ready to go or has already supplied net zero asphalt for commercial-scale projects. Testing with many other manufacturers is in progress.



"THE CHARACTERISTICS OF THE MATERIAL SEEM VERY SIMILAR TO WHAT WE EXPECT COMPARED TO A CONVENTIONAL MATERIAL"

Robert Syer
Project Manager, Tarmac

NO CAPEX
SAME PROCESS
NO RETRAINING
DROP IN SOLUTION

TESTIMONIALS

Low Carbon Materials

"WITHIN AN EIGHT MONTH PERIOD A NEW, UNPROVEN, UNTESTED MATERIAL HAS BEEN THOROUGHLY TESTED AGAINST HIGHWAY SPECIFICATIONS AND SUCCESSFULLY TRIALLED ON THE NATIONAL HIGHWAYS STRATEGIC ROAD NETWORK. EIGHT MONTHS AGO I DIDN'T BELIEVE THAT WOULD BE POSSIBLE. IT IS AMAZING WHAT CAN BE ACHIEVED THROUGH EFFECTIVE COLLABORATION."

Paul Cole, Chief Engineer, Skanska

"THE CHARACTERISTICS OF THE MATERIAL SEEM VERY SIMILAR TO WHAT WE EXPECT COMPARED TO A CONVENTIONAL MATERIAL"

Robert Syer
Project Manager, Tarmac

"ACLA IS GOING TO BE A MATERIAL THAT IS LIKELY TO BE USED IN THE FUTURE TO REDUCE THE CARBON POTENTIAL IN FUTURE PROJECTS."

Melissa Giusti,
Project Manager, National Highways

"REDBRIDGE IS ALWAYS STRIVING TO FIND INNOVATIVE WAYS TO REDUCE OUR EMISSIONS. WE'RE PROUD TO BE THE FIRST LONDON BOROUGH PARTNERING WITH KENSONS, LOW CARBON MATERIALS, AND TARMAC TO DELIVER THIS PIONEERING NEW TRIAL."

Redbridge Council's Cabinet Member for Environment and Sustainability, Cllr Jo Blackman

"ACLA IS A FANTASTIC INNOVATIVE MATERIAL. IT IS FLEXIBLE TO USE AND EASY TO ACHIEVE VERY LOW CARBON VALUES THROUGH ALL MIXES. THE BENEFIT OF USING THIS PRODUCT IS YOU CAN STORE IT VIRTUALLY ANYWHERE. NO SPECIAL STORAGE OR EQUIPMENT IS REQUIRED. HAVING USED ACLA, I SEE IT AS A FRONT-LINE TOOL AGAINST CARBON LEVEL REDUCTION IN 2025."

Dave Whitehouse, Head of Research and Product Development at Tynedale Roadstone Ltd. MGL Group

"WE INITIALLY ENCOUNTERED LOW CARBON MATERIALS AT THE HIGHWAYS UK SHOW. UPON INVESTIGATING THE PRODUCT, WE QUICKLY REALISED ITS POTENTIAL INTEREST FOR REDBRIDGE."

David Shelley
Director for Kenson Highways

"MGL GROUP'S CONTINUED PARTNERSHIP WITH LOW CARBON MATERIALS AND DURHAM COUNTY COUNCIL REINFORCES OUR SHARED COMMITMENT TO A SUSTAINABLE FUTURE. BY COLLABORATING ON FURTHER SCHEMES, INCLUDING OUR WORK AT FRONT STREET, SUNNISIDE, WHERE THE RAINTON CONSTRUCTION TEAM IS LAYING OUR NET ZERO ASPHALT, WE AIM TO DECARBONISE THE BUILT ENVIRONMENT AND CREATE A LASTING POSITIVE IMPACT."

Dave Elliott
MGL Group's Joint Chief Executive

"THIS NEW MATERIAL WILL PLAY A KEY ROLE IN CARBON REDUCTION AND, WHEN USED IN CONJUNCTION WITH OTHER SUSTAINABLE MATERIALS, ALLOWS THE WHOLE PROJECT TO BE SIGNIFICANTLY LOWER IN EMISSIONS THAN STANDARD RESURFACING WORKS."

Alan Patrickson
Durham County Council's Corporate Director for Neighbourhoods and Climate Change

"ACLA IS A FANTASTIC INNOVATIVE MATERIAL"

Dave Whitehouse, Head of Research and Product Development at Tynedale Roadstone Ltd. MGL Group


Low
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