DELIVERING SUSTAINABLE HIGHWAY SOLUTIONS

Colas Surface Treatments include In-Situ and Ex-Situ Road Recycling, Micro-Surfacing, Fibredec Surface Dressing and Slurry Seal. These coldapplied -treatments reduce emissions, waste and disruption, and can solve the issue of tar contamination. We assist clients in significantly lowering highway maintenance costs and improving the carbon footprint.





WE OPEN THE WAY

RETHINK **YOUR SURFACE TREATMENTS**

MAKE YOUR BUDGET GO FURTHER. At Colas we know the challenges facing road engineers require some innovative thinking and environmental savings.



Road surfaces across the UK continue to deteriorate after years of under-investment and Local Authorities are working harder than ever to keep their road networks safe and well-maintained. As budgets shrink, rate-payers still expect their highways to be kept in good condition with minimal disruption and environmental impact.

Colas surface treatments are a preventative maintenance measure to seal roads and footpaths against the ingress of water, a leading contributor to potholes and deterioration of the asset. The processes give proven financial and environmental savings against conventional surfacing methods.

We draw upon the experience and expertise of our 1200-strong research and development team to continually improve highway maintenance techniques and treatments that are extremely robust and reliable.

We are committed to reducing direct greenhouse gas emissions by 30% and upstream indirect emissions by 30% by 2030.







Our portfolio of Specialist Surface Treatment options offers clients a number of benefits:

Durable

Our tensile Fibredec solution improves overlay performance by 30% compared to traditional blacktops. All solutions extend the life of the existing surface.

Affordable

Our high quality, efficient Microasphalt save you money and cause fewer delays for your road users.

Sustainable

Our cost-effective Road Recycling products lower CO² emissions by up to 72%, cut waste and reduce lorry movements.









THE DURABLE SOLUTION THAT REDUCES REFLECTIVE CRACKING AND IMPROVES TENSILE STRENGTH.

Fibredec combines bitumen emulsion, chopped glass fibre and aggregate to create a strong, flexible and waterproof design. Applied either as a highly resilient surface material or as a stress-absorbing membrane interlayer (SAMI), Fibredec is highly versatile and delivers significant performance improvements on more traditional surfaces.

Use Fibredec to:

- Add a waterproof and flexible membrane to cracked and crazed surfaces
- Restore skid resistance to spalling or fretting concrete and blacktop
- Provide a cost-effective surface for unbound, granular sub-bases
- Create a cushion-like stress-absorbing membrane, far more effective than a conventional SAMI

Available in various colours and textures

Fibredec is available with a range of different natural aggregates, giving a choice of surface finishes.

HOW FIBREDEC WORKS

Fibredec reduces reflective cracking by providing additional tensile strength to absorb any movement in the pavement structure. If cracking in the underlay occurs, Fibredec minimises permanent lateral movement in the overlay material by easing and distributing the strain over a wider area.



Extra strong. Extra versatile

Clients use Fibredec as a SAMI or reinforcing treatment for many types of surface, including bitumen macadams, concrete, granular unbound bases, rolled asphalt and worn surface dressings. Laid as a single coat, double coat or racked-in dressing, its applications range from roads and car parks to cycleways, parks, canal paths, forestry roads and recreation sites.

Easy application. End-to-end care

Fibredec is applied with a fast and efficient process that causes minimal disruption and carbon footprint. Specialist equipment enables operators to deliver high output whilst maintaining sensitive control of the surfacing process. This means that Fibredec can be laid in almost any environment, including areas with difficult access. Clients also benefit from the Colas end-to-end contracting service which covers preparation, application and after-care.

Heritage and decorative surfacing

Our decorative surfacing design brings together a combination of materials, carefully selected to harmonise with their surroundings and designed to meet the requirements of different site conditions and usage patterns.



30%

Proven strength and flexibility

Independent research* shows that road samples using a Fibredec SAMI significantly out-perform surfaces with no SAMI. Fibredec enhances resistance to fatigue and tensile stress by 30% and wheel-tracking by 300%.

> *Performance of 'SAMI'S in Simulative Testing, Nottingham University.

MICRO-SURFACING

THE SUSTAINABLE ALTERNATIVE TO CONVENTIONAL SURFACING THAT SAVES YOU TIME AND MONEY

Our Micro-surfacing process is cold-applied so uses less energy and reduces carbon emissions. It comes with a choice of versatile materials so it can tackle a broad range of engineering challenges. Bitutex FP, Paveseal, Ralumac HT high texture, Ralumac and Colmat each offers specific application and performance benefits, and all conform to National Sector Scheme 13 and ISO 9001.

BITUTEX FP

Bitutex FP is an ideal preventative maintenance technique, sealing the existing surface for footpaths, cycle paths, car parks and carriageways with restricted access. It is a blend of bitumen emulsion, aggregate and additives to provide maximum effectiveness, rapid curing and an even surface coating. It regulates and fills everything from minor cracks and crazing to 15mm deep potholes and marks without pre-patching. Bitutex FP adheres and strengthens quickly, allowing use by pedestrians in as little as 20 minutes, and motor traffic in as little as an hour.

Benefits:

- Improved appearance and surface texture
- Adheres to a wide range of bitmac and concrete surfaces
- Seals against water ingress
- Extends surface life by up to 10 years



PAVESEAL

Paveseal is used for repairing severely deteriorated footpaths and carriageways. Based upon the Bitutex FP formulation but also incorporating cellulose fibres and polymer-modified bitumen, Paveseal provides enhanced tensile strength and out-performs conventional slurry surfaces.

Benefits:

- Improved appearance and surface texture
- Adheres to bitmac and concrete surfaces
- Seals against water ingress
- Fills and regulates depressions up to 25mm deep
- Extends surface life by up to 10 years
- Used on light trafficked carriageways and in areas with restricted access
- Used in car parks and on train station platforms

AIRFIELD SLURRY SEAL

Bitutex is machine-applied when used on airfields and produces a uniform ultra-thin surface seal when used on a sound substrate. The process prevents the ingress of water and can be applied on a wide range of macadam surfaces.

Contact us to find out more about the use of slurry seal microsurfacing on Airfields in the UK and further afield.

RALUMAC

Ralumac is a polymer modified, HAPAS approved micro-surfacing technique that regulates depressions up to 40mm deep and can be trafficked in 30 minutes.

Ralumac is high quality micro-surfacing which has been developed and utilised by Colas for in excess of 40 years, the specialised Bitumen emulsion is manufactured in-house by Colas who are one of the world's leading bitumen manufacturer's suppliers.

Ralumac regulating capabilities can substantially reduce the extent of prepatching work required and is hardwearing and aesthetically pleasing at the same time reduces road noise, seals existing surfaces from the ingress of water and restores skid resistance and improved ride quality.

RALUMAC HT

Ralumac HT (High Texture) incorporates heavier-grade aggregates, increased texture depth for use on high speed roads, motorways and routes experiencing high volumes of traffic. This polymer-modified microasphalt speed of application reduces disruption to road users compared to conventional micro-surfacing methods and very effective for filling ruts, improving skid resistance and protecting road surfaces from water ingress.



BEFORE



COLMAT

The micro-surfacing designed by COLAS combines a highperformance polymer modified bitumen emulsion with specifically selected high quality fine aggregates. The high binder content of the mixture allows it to fill any depressions, cracks and/or ruts in the existing pavement, thereby giving a new even profile while also re-sealing the pavement from water ingress and its associated damaging effects.

When used on roads that require a minimum level of surface texture a percentage of larger high quality aggregates can also be added.

Benefits:

• Speed of application and reduction of disruption to road users

- Versatile
- Low carbon emissions
- Resolves wheel track rutting and deformations
- Low noise characteristics
- Applied by a modern fleet of specialist equipment that carry all components and complete treatment in two passes, the first pass regulates and re-profiles and the second pass gives the ride quality
- Uniformed sealed surface course
- Resistant to heavy traffic volumes
- Restores skid resistance and surface texture





COST-SAVING PROCESSES THAT REDUCE YOUR CARBON FOOTPRINT BY UP TO 77%

Heavily deformed, potholed or deteriorated carriageways and footways are broken down and re-used in-situ which minimises disruption, waste and reduces the cost associated with conventional resurfacing.

Colas provides a choice of carbon-friendly Road Recycling processes which include Retread and Deep In-Situ Recycling. Other benefits include:

- Minimal or zero waste is sent to landfill
- In-situ recycling of existing materials with minimal use of imported virgin aggregates results in fewer lorry movements and lower CO₂ emissions
- Shorter construction periods minimise disruption
- Tar-bound material is encapsulated and does not need to be exported and processed outside the county



BEFORE

DEALING WITH TAR BOUND MATERIALS

Local Authorities have a duty to deal with contaminated waste created by traditional plane-out and inlay resurfacing on pavements containing coal tar.

Instead of stockpiling or re-processing off site, Colas' Road Recycling processes safely and legally encapsulate tar-bound material.

All the processes are carried out at ambient temperature, meaning there is no risk of fuming coal tar products.

Colas can even help Local Authorities to utilise existing stockpiles of tar contaminated planings.

CHOOSING THE

Colas independent experts are always on hand to give

GREENEST

RETREAD

Used on carriageways and footways, Colas Retread recycles the existing pavement in-situ to a depth of 150mm to form a durable flexible pavement and seals out water to improve service life.

Retread is extremely versatile and works to existing kerb and ironwork levels, meaning expensive pre-patching and civils work can be avoided. Drainage issues can often be resolved when re-profiling the road.

Alternative surface treatments can be used to finish the site, depending on client requirements. Colas are able to advise whether a Fibredec Surface Dressing, Asphalt DBM or a Microsurfacing treatment would be suitable.

Colas own and operate a wide range of plant, meaning Retread can be specified for roads, footpaths (including footpaths with concrete slabs), canal paths and forestry access roads.



AFTER









THE RETREAD PROCESS

Our experienced engineers carry out core sampling to establish depth of construction, binder content and a tar-contamination check.

If suitable, the road is closed using our in-house Traffic Management operatives. It can then be broken down using a specialist planer.

Using a custom-made grader, the surface is re-profiled to ensure drainage is adequate and to tie in to existing kerb and ironwork levels.

A bitumen emulsion designed and manufactured by Colas is then sprayed to a calibrated spread rate and mixed in. This coats the broken down aggregate and encapsulates any tar-bound material.

5

Using dead-weight and vibrating rollers, the site is compacted to the required stiffness and a further application of bitumen emulsion is applied, followed by an application of 14mm chippings to close surface voids.



A double 6mm surface dressing completes the site, leaving an attractive and uniform finish.





DEEP RECYCLING

Suitable for most road types, Colas Deep Recycling is a fast and economical cold process for reconstructing badly deformed roads and haunch failures.

The process consists of mixing bitumen emulsion or hydraulic binders (for example PFA and cement) with recycled material from the existing pavement in-situ. This reduces disruption by removing the need to haul planings away as well as reducing reliance on virgin aggregates. As the process is carried out cold, very little CO₂ is generated.

Colas' cold in-situ road recycling process is carried out in accordance with the Specification for Highway Works clauses 947, the design guide 611 from the TRL and the RSTAs Code of Practice for Deep In-Situ Recycling for the Treatment of Roads.

All of Colas' cold in-situ recycling processes begin by carrying out a detailed site inspection followed by sampling using cores or trial pits to determine the depth and make-up of the existing pavement.

The site is then designed by one of our experienced engineers to ensure the correct specification is used, and optimum binder and moisture content is achieved during the work. If additional imported aggregate or road planings are required, it is highlighted at this stage.

On site, the recycling operation is carried out by specialist equipment that include the self-propelled recycler, an emulsion tanker, a water tanker, a grader and rollers. The recycler acts to mill up and pulverise the existing pavement material to a specified depth while at the same time, mixes the emulsion or hydraulic binders to recycled material using computer-controlled pumps and flow meters.

After pulverisation, the surface is compacted and trimmed. Excess material is removed before recycling the existing pavements. Emulsion and hydraulic binders are combined with the existing material and fuel ash or cement may be added. Once the recycling is complete, the material is compacted again, surface-shaped and coated with bituminous emulsion and sealing grit.



- Conserves natural resources by recycling materials such as china clay and glass
- Complies with EU regulation by treating tar-bound layers in-situ without the need for costly removal
- Up to 1500m² per day can be processed while leaving all material in place throughout operations to minimise disruption

RETREAD CASE STUDY

Following on from successful contracts. Colas continued to work to improve carriageways, offering 20 rural lanes totalling c145,000m².

The client was impressed with the reduced construction time during the works, recognising the economic and environmental benefits of this process, compared to conventional surfacing processes.

THE NEED

One specific carriageway was identified for Retread due to severe potholes and rutting throughout the site, often causing damage to resident's vehicles.

This rural lane has existing 'tar bound' material within the construction layers, therefore as well as reusing the existing material, additional tar bound planings were imported onto site and pulverized within the construction layers.

This further benefits the client as it reduces the existing stockpile of what is basically an undesirable material. With Colas's unique down milling procedure integrating the tar bound material perfectly within the sub strata, the site now has a structurally sound, visually pleasing surface that will withstand the localized farming traffic.

CHALLENGES

Diversions were set up by the local authority to avoid as much disruption to residents and local traffic as possible.

Colas supplied the advanced warning boards prior to, and the roadworks signage throughout the duration of works.

Each site always allowed access for residents coming in/out of their driveways, but they were notified prior that there might be minor delays and to allow extra time for journeys. Emergency services had access at any time if needed.





BEFORE

AFTER



- > April August 2019
- > Finished on programme with no delays

total Green

House Gases used

SAVING

- Lowering the carbon footprint
- > Cost effective solution
- Reduced waste

total energy

consumption used

76.76%

SAVING

> Sustainable process

SOLUTION



Due to the deformation in these lanes, Retread proved to be the best process for repair, due to our ability to form a durable reprofiled carriageway. The surface was compacted and an application of binder and 14mm chippings were rolled in to close surface voids. A double 6mm surface dressing finished the process, to which any choice of surface material can be applied if deemed necessary.

ASSOCIATED BENEFITS

Retread can work to existing levels leaving kerbs and iron work undisturbed, thus reducing costs. Time required on site was significantly reduced in comparison to conventional road surfacing treatments, reducing overall disruption to the community and road users.

COMING TO THE UK IN 2021

Being part of the International Colas Group enables us to access innovations from around the world. We work closely with our International colleagues to identify new processes suitable for the UK road network. In 2021, we will be introducing two brand-new process to the UK.





The new Colas process for guick, economical and clean projects with 100% recycling.

Suitable for most road types, Colas' new process recycles 100% of the existing surface in-situ and provides a machine-laid finish which can be trafficked almost immediately.

Novacol ensures high performance binder and base courses by recycling and regenerating the upper courses of the roadway.

Novacol is a high performance technique which:

- restructures damaged layers
- regenerates binder if required
- has no loose bonds or cracks
- · improves longitudinal evenness and transverse profiles

VALORCOL

Valorcol is a cold mix surfacing process consisting of reclaimed asphalt pavement (RAP) that is usually 100% of the content.

The process reuses the milled materials obtained from the same site or from existing stockpiles at other construction sites. The reduction in new resources and reduced traffic movements delivers an efficient and effective reduction in environmental impact.

This process:

- can recycle 100% of tar contaminated planings
- utilises current RAP stocks
- substantially reduces carbon footprint
- can be laid in thickness of 40 to 200mm
- can be applied to all types of pavements for low to moderate traffic





COLAS: RETHINKING ROAD ENGINEERING FOR YOUR BENEFIT

Colas is an award-winning business, delivering sustainable solutions for the UK's transport infrastructure. We invest, design, construct, maintain and operate a wide variety of projects for the public and private sector clients. Our innovative thinking is helping Local Authorities across the country to keep their roads safe, well-maintained and managed. Our Road Recycling and Specialist Surface Treatments extend the life of pavements and yield environmental and economical benefits.

We're part of the International Colas Group, whose world-class Research and Development facilities give our clients access to innovative new products, processes and ideas.

Sustainability and innovation are at the heart of everything we do. As technology and techniques evolve, our solutions do too.

We provide the complete service, from investment and design right through to project delivery and aftercare. At every step, we have experts with the capability and skill to turn the vision into reality. Our people all share our passion to deliver excellence in everything we do.

BUILDING THE ROAD TO A GREENER FUTURE



What all these treatments have in common is their strong sustainability credentials. They provide a real sustainable alternative to conventional maintenance and reconstruction by offering solutions that are less energy intensive and generate minimum or no waste thus helping local authorities to meet their NI 185 and NI 186 carbon reduction obligations.

In addition, they provide considerable cost economies that enable both national and local highway authorities to get best value for their pressurised budgets. Sustainable and cost-effective, Colas specialist surface treatments are the solution.



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