



Safer
Sustainable
Solutions

ECO5 - HIGH PERFORMANCE SUSTAINABLE ASPHALT



Paving ECO5 on the access roads at Newcastle Port in December 2020



At COLAS Australia, we've been thinking ahead.

Our roads connect more than people and place, they connect our futures. They take our young ones to school and old friends on new adventures. They help our businesses reach new customers and our customers get to work. From work to play, they keep us connected to things that matter most to our lives. Our country has over 350,000 kilometres of paved roads and more than half a million kilometres of unpaved roads — that's why we're helping Australia go from A to Better with safer, more sustainable solutions.

Introducing ECO5

ECO5 has been specifically developed by using quality controlled selected recycled waste materials with a proven track record of performance to provide an asphalt which will last longer and outperform conventional dense graded asphalt.

ECO5 is a cost-effective alternative to most conventional dense graded asphalt products only safer, longer lasting and more sustainable. **ECO5** can be used as wearing course or structural asphalt to replace the equivalent dense graded asphalt mix. It is suitable for use on residential streets, arterial roads, parking areas and in industrial areas

What are the benefits of using ECO5?

It is more sustainable than conventional asphalt because of its:



Improved performance resulting in a longer service life with less maintenance and less disruption to traffic



Reduced demand for non-renewable raw materials like aggregates, sand, hydrated lime, bitumen and polymers by replacing them with recycled secondary waste materials



Produced at lower temperatures which reduces the quantity of burner fuel required to heat the aggregates and also reduces the generation of greenhouse gasses and fumes

Every tonne of ECO5 asphalt incorporates:

- Recycled glass bottles
- Recycled rubber from end of life truck tyres
- Recycled old asphalt
- Produced at lower temperatures than conventional hot mixed asphalt
- Uses liquid adhesion agent to reduce the carbon foot print compared with using hydrated lime

The quantity of the recycled content will depend on the mix type and application as shown in Table 1.

Typical recycled content by mix type and application

Mix type	Application	Minimum thickness (mm)	Rubber, Glass & RAP (%)
AC10	Wearing course	35	25
AC14	Wearing course	50	25
AC14	Intermediate	50	40
AC20	Base course	60	40

To put this into perspective a one kilometer lane surfaced with 50mm layer of AC14 ECO5 mix will:

- recycle approximately 559 old equivalent passenger tyres and 56,966 empty stubbies
- preserve 8 tonnes of virgin bitumen and 94 tonnes of mineral aggregates

So trade in your old asphalt surfacing for a recycled new high performance one!

THE RECYCLED RAW MATERIAL REUSED IN ECO5 ARE:



Recycled Asphalt Pavement (RAP)

Asphalt is 100% reusable which means that at the end of its service life it can be reused to produce new asphalt. Reclaimed Asphalt Pavement should not be considered as a waste but an engineered product. Therefore, RAP should not be disposed of but reused in the production of new asphalt to reduce the demand for virgin bitumen and crushed aggregates.



Recycled Crushed Glass (RCG)

The concept of using crushed glass as an aggregate isn't new and can be traced back to the early 1960's. The studies showed that the high angularity of crushed glass as a sand replacement, compared to commonly used rounded natural sand, enhances asphalt's stability, when crushed to a consistent grading and incorporated in controlled proportions. Other benefits include lower absorption and lower specific gravity, meaning higher binder film thicknesses.



Warm Mix Asphalts (WMA)

Warm mix asphalt is essentially the same as hot mixed asphalt except that it has been produced at a lower temperature without compromising its ability to be paved and compacted. WMA helps satisfy the community's need to reduce greenhouse gas emissions and energy consumption during the manufacture and paving of asphalt. Producing asphalt at lower temperatures also results in less oxidization of the binder which in turn will ensure a longer service life for the asphalt.

Crumbed Rubber (CR)

Rubber derived from end-of-life tyres can be used to improve the performance of asphalt. Rather than dispose of old tyres in landfill, the rubber can be recovered to modify bitumen for producing new asphalt. The rubber contains polymers and carbon black which improves the performance properties of the bitumen. The rubber is ground into particles which can either be preblended with bitumen or added directly into the pugmill when mixing the binder with the heated aggregates. The practice of recycling crumb rubber from old tyres into asphalt is a well proven technology and offers extensive benefits to society and road asset owners.

Liquid Adhesion Agent (LAA)

The use of a special liquid adhesion agent will help improve the moisture sensitivity of the mix and improve the low temperature compaction of the mix. The replacement of hydrated lime with LAA reduces the carbon footprint of the asphalt by 50-fold.

Performance properties of ECO5

Table 1 below provides a comparison of ECO5 performance against heavy duty dense graded asphalt.

Property	Test Method	COLAS Heavy Duty Typical Value	COLAS ECO5 Asphalt Typical Value	Requirement for TfNSW Roads
Wheel Tracking 10,000 passes @ 60°C (rut depth mm)	AGPT/T231	3.1	2.6	Report
Resilient Modulus @ 25°C (MPa)	AS2981.13.1	6800	5900	Report
Beam Fatigue 400 microstrain @ 20°C (cycles to failure)	AGPT/T233	108,649	360,807	Report
Moisture Sensitivity (TSR %)	T640	95	87	≥ 80
Average Tensile Strength (kPa)	T640	800	1070	> 600

At COLAS we are RAP'd about making our asphalt more sustainable. So for your next project contact your local COLAS office for a quotation for supplying and laying ECO5.

For further information

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