



Safer Sustainable Solutions

THE FUTURE IS WARM.



What is Warm Mix Asphalt?

Warm Mix Asphalt (WMA) is essentially the same as Hot Mixed Asphalt (HMA) except that it has been produced at a lower temperature without compromising its ability to be paved and compacted.

Safer Sustainable Solutions

WMA helps satisfy the community's need to reduce greenhouse gas emissions and energy consumption during the manufacture and paving of asphalt.

Some of the key benefits of reducing HMA mixing temperatures are:



Reduction in the amount of energy required to heat the aggregates. Approximately 4% reduction for every 10°C drop in the mixing temperature.



Reduction in the generation of Green House Gasses which is good for the environment.



Reduction in the generation of fumes and odours which will have a positive impact on workers' health during paving operations.



To facilitate the **construction of multilayers** of asphalt in the same shift.



Increase the durability of asphalt wearing courses in low trafficked environments due to less ageing of the binder.

THE FUTURE IS WARM?

The use of WMA is becoming increasingly popular worldwide. Warm mixes are produced at lower temperatures than conventional hot mixes using a range of special technologies, while maintaining the same asphalt performance properties in service.

Sustainability isn't just another word to us, it's work to us. So lets work together to improve the sustainability of road provision by using WMA for your next project.

COMPACTION

Figure 1 shows that the same compaction can be achieved when using WMA technology at lower temperatures.

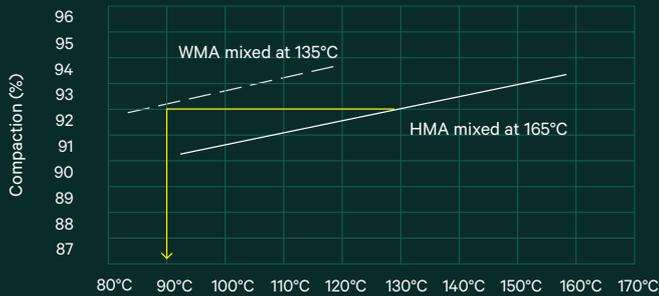


Figure 1: Compaction of asphalt manufactured at different temperatures

COLAS IS COMMITTED TO REDUCING ENERGY, INCREASING RECYCLING AND PUTTING SAFETY FIRST.

Making asphalt more sustainable

The use of WMA allows us to reduce our carbon footprint and improve the health of our workers by reducing asphalt manufacturing temperatures. This can further be enhanced by using RAP, rubber from old tyres and recycled crushed glass without compromising the performance or the overall quality and performance of the asphalt.

PRODUCTION & CONSTRUCTION

WMA reduces the binder's viscosity making it easier to compact asphalt at lower paving temperatures. This phenomena is also aided by the fact that WMA has a more uniform temperature across the surface of the mat than HMA and that at a lower temperature the rate of cooling is slower. This will lead to:

1. More uniform compaction and improved compaction of construction joints.

2. Improved productivity because one can pave multiple layers in one shift without having to wait for the bottom layer to cool down. One can also pave more asphalt in each shift because the time required for the asphalt to cool down before it can be opened to traffic is reduced.

A further reduction in the mixing temperature can be achieved depending on the layer thickness, distance of the job site from the asphalt plant and the ambient paving temperature. Refer to Table 1 for guidelines for reducing temperatures.

Constraint	Target asphalt mixing temperatures, °C										
	WMA Additive	Foamed bitumen					No additive				
	Mix type	DG10	DG14	DG20	SMA10	SMA14	DG10	DG14	DG20	SMA10	SMA14
Binder type	C320 / C450	150	150	150			160	160	160		
	C600			160					170		
	A15E		165		175	175		170		180	180
	A10E		170		180	180		175		185	185
Layer thickness	> 50mm		-5								
	> 70mm			-10							
Travel time to job site	< 1 hour	-5	-5	-5	-5	-5					
Ambient temperature	> 30°C	-5	-5	-5							

Table 1: Guideline for reducing mixing temperatures for different conditions when using WMA foam versus HMA

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