Much Asphalt

Together We Can

MUCH ASPHALT

RECYCLED ASPHALT (RA)

60 YEARS OF SERVICE
1965 – 2025

Asphalt pavement is 100 percent recyclable and reusable. Recycled asphalt is milled out of the surface layers of an existing asphalt paved road and then crushed, screened and combined with virgin asphalt mixes for new surfacing applications.

Recycled Asphalt (RA) is added to hot mix asphalt in different quantities depending on the engineering design of the project to be surfaced and the capability of the plant producing the mix.

Significant percentages of recycled material can also be added to Warm Mix Asphalt (WMA), another asphalt technology that has gained global acceptance due to its environmental and other benefits.

FINANCIAL AND ENVIRONMENTAL BENEFITS

Reclaiming asphalt material offers financial savings all round in material costs, including asphalt binder, energy costs and total job costs. So everyone benefits, including the tax payer who ultimately pays for the building and maintenance of our roads.

The aggregates and bitumen used in the production of asphalt are non-renewable and increasingly rare resources, with significant cost incurred in the quarrying of aggregates and the extraction of crude oil from which the bitumen is produced.

In addition to saving the cost and carbon emissions involved in extracting and transporting these raw materials, the reuse of milled asphalt saves on waste and landfill space. Bitumen has recently become particularly scarce in South Africa and has to be hauled long distances in some cases when local supply is unavailable to fulfil contractual requirements, adding considerably to the cost.

The fact that material milled out for road rehabilitation purposes now has a value obviates the expense associated with removing it to spoil or stockpiling it in a road reserve for future use. The overall cost of transporting the material back to the asphalt plant for recycling is far lower than the cost of mining, transporting and processing virgin material.

IMPROVED PERFORMANCE

The misconception that recycling produces an inferior product has been proven wrong and, in fact, studies have shown that mixes with RA produce improved performance to conventional mixes. Hot asphalt mixes containing RA have been shown to age at a slower rate than mixes with virgin materials because the binder in the RA has already undergone oxidation, so the rate of hardening of the RA mix is slowed.

Recycled asphalt undergoes the same stringent testing and quality control as all asphalt products.

RECLAIMING, HANDLING AND STORING RA

Milling

Most RA in South Africa is obtained through the use of milling machines rather than by breaking out the existing asphalt layers in the pavement using excavators or bulldozers.

Use of a milling machine has the advantages of fragmenting the asphalt to a fairly uniform grading and the ability to mill to a prescribed thickness and in separate layers to preserve individual layer material qualities.

The asphalt can also be removed without disturbing the edges or underlying pavement materials, reducing the risk of contaminating the RA.

Stockpiling

Material from different sources and sites should be stockpiled separately to avoid the mixing of materials with different characteristics.

It is important to reduce the moisture content of the RA before it is recycled as high moisture content decreases the rate of production. A 1% increase in moisture content can increase the fuel consumption required to heat the RA by 10%.

Inconsistent moisture contents may cause fluctuations in mix temperature. The aim should be for the RA to have a consistent moisture content of not more than 4%.

To reduce moisture content, RA stockpiles should be sloped to facilitate drainage, with a hard base that does not soak up water and also to reduce the chance of groundwater contamination. Stockpiles should not be covered, except when rain is imminent, as this causes condensation and increases moisture content.

Processing

Consistency is important to the quality of the asphalt mix containing RA and the material is therefore crushed and screened into separate stockpiles, each with material of uniform quality in a defined range of particle sizes.

The need to crush and screen into separate fractions to ensure a consistent product becomes increasingly important as the RA content of the recycled mix is increased. Knowing the properties of the stone and bitumen in the RA is also key to good quality recycled asphalt mix.

RECYCLING AT MUCH ASPHALT

Much Asphalt started recycling road material in 2007 and the benefits were immediate when a runway rehabilitation contract at OR Tambo International Airport called for 10% recycled material to be included in the bitumen treated base course. This required Much Asphalt Benoni to screen more than 8 000 tonnes of recycled material alone.

In 2011 the Benoni branch commissioned new mobile crushing and screening equipment valued at R4 million for recycling of road millings and waste material.

The new machines, an impact crusher and a mobile screen, were immediately put to work to prepare a 300 000 tonne stockpile of reclaimed asphalt for recycling. To meet demand they are running between five and six hours a day, achieving an output of around 90 tonnes per hour.

About 95% of the material recycled by Much Asphalt can be used in various asphalt mixes where RA is included in the project specifications and the stockpile at the Benoni facility provides a constant supply of recycled material to add back into our asphalt mixes.

Much Asphalt also offers recycling capability at other major plants and has a programme in place to roll out recycling across all its facilities.

Warm mix asphalt

Warm Mix Asphalt (WMA) technology was introduced in 2010 at Much Asphalt Benoni and is available at all Much Asphalt plants today. WMA allows for the addition of significantly higher RA content to a conventional asphalt mix without excessive emissions or poor workability. Less aging of the virgin binder in warm-mix production may also allow for higher percentages of RA.

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