Predicting Seal Age from Binder Oxidation Using FT-IR Spectroscopy

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ABSTRACT

The aim of this study is to estimate the age of bituminous binders using the outputs of portable Fourier Transform Infrared (FT-IR) Spectroscopy device. The output of FT-IR is a spectrum of the chemical composition of the binder where different peaks represent different chemical groups. The peak at the carbonyl chemical group represents the level of binder oxidation. As binder age is directly related to its oxidation level, the output of portable FT-IR can be used to estimate the age of binder samples on site.

To achieve the aim of study, samples of spray seals, with known ages, have been collected from five regions with different climatic conditions. For each region, the age groups of samples include less than 3years old for fresh samples, 3 -10 for Intermediate I samples, 10 -15 for Intermediate II samples and 15+ years old for end of life samples. All samples from a region have the same binder class, which is suitable for the relevant climates. Spray seal is the common practice for sealing rural road networks in Australia. It is a thin layer of bituminous binder sprayed over the compacted granular base with single size aggregates rolled into it.

In this study, all binder samples have been tested using the portable FT-IR device and their oxidation levels have been estimated. The latter is represented by the area under the carbonyl peak (wavenumber 1679 cm^{-1}) of their spectra. These outputs for each region are then linked to their corresponding ages using Beer's algorithm. The developed reference curves can be used by road agencies of these regions to predict the ages of their seal networks on site. The results have shown that samples with the same age but from different climatic regions have different levels of oxidation.

Keywords: Binder oxidation, Climate, FT-IR, Spray seal, Stress ratio, Viscosity.

Permeability benchmark analysis of thin asphalt layers using grading and voids QA/QC data

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ABSTRACT

Aggregate packing is considered the main load bearing mechanism in the design of hot mix asphalt (HMA) and the use of fundamentally correct volumetric methods like the Bailey method, the Dominant Aggregate Size Range (DASR) and Binary Aggregate packing (BAP) allows improved aggregate skeleton strength analysis of Hot Mix Asphalt Mixes (HMA). The recent development of the Rational Bailey Ratios (RBRs) has enabled the articulation with DASR method as well as BAP principles.

This enables porosity calculations for contiguous (consecutive) aggregate fractions and ranges of aggregate fractions on the normal aggregate grading curve. This RBRs as framework enables porosity calculations facilitating a more fundamental correlation with density, aggregate packing and permeability. Other ongoing research which focusses on the link between pore opening and voids in the mix enables an improved link with the interconnectedness aspect.

This approach provides for a universal regression formulation that enables permeability potential calculations from as-built data. New understanding of the impact of the difference between vertical permeability and much higher horizontal permeability in thin asphalt layers observed in the field have led to novel field permeameter permeability test development. The impact of tyre surface contact with high excessive pore water pressure observations led to the development of a novel permeability stress test in the laboratory.

A multi-dimensional benchmark analysis could successfully be used to determine the permeability potential of an asphalt mix inclusive of RBRs and porosity indicators. These RBR concepts enhancing permeability monitoring and new laboratory and field tests with pore size correlation and calculations are illustrated using recent investigations on road projects in South Africa with known permeability problems. The analyses are done through typical benchmark scrutiny to illustrate how the field observations of permeability can be corroborated.

Keywords: Bailey Method, Rational Bailey Ratios, Dominant Aggregate Size range, Binary Aggregate Packing, Porosity, Permeability, Hot Mix Asphalt., High Pressure Permeability test, Falling Head Field Permeameter

Keywords: Falling Weight Deflectometer, Traffic Speed Deflectometer, Benchmark analysis, Deflection Bowl Parameters, Probability Density Functions

Introduction of GB5® to Australia

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ASTRACT

GB5® is a high performance asphalt used in base courses. It was developed as a next generation alternative to EME2 and is accepted as at least equivalent to EME2 for pavement design in France. GB5 incorporates a hard polymer modified binder (PMB) instead of the unmodified hard penetration grade binder used for EME2. The other patented part of the GB5 technology is the aggregate packing concept involved in the mix design. Since its inception in 2010, over 5 Million tonnes of GB5 have been paved to date in France, Spain and South Africa. In 2020, the first demonstration of GB5 took place in Australia. This paper presents the relative performance of GB5 compared to EME2 from international laboratory and full scale experiments. The first results of GB5 tested against Australian EME2 specifications, local field performance and use in Australian pavement design are presented as well.

Optimising the use of recycled plastic in asphalt for high performance

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Using polyethylene to modify the properties of asphalt mixes date back to the beginning of the 70's and first use of recycled plastic in Hot Mix Asphalt has been carried out on large scale in the 80’s in Europe. Recently, the use of recycled plastics in asphalt mixtures has triggered the interest of both the plastics and asphalt pavement industries as this recycling effort can provide substantial environmental benefits.

However, precautions should be taken regarding plastic selection, incorporation methodology and final performances of the mixtures must be carefully assessed.

One of the major challenges for the recycling of plastics in roads is the variability of the feedstock, especially post-consumer sources which constitute by far the bulk of the plastic waste stream. Indeed, recycled plastic wastes can contain different type of polymer which are not suitable for the intended use so these materials must be tested before to identify their nature and approximate composition to confirm if they are suitable for manufacturing asphalt mixes.

Hot Mix Asphalt modification with recycled plastic can be achieved by prior blending into the asphalt binder, known as “Wet Process” technology but this process requires to select high quality recycled product. Another cost-efficient method is the “Dry Process” where recycled plastic is incorporated as a solid additive during the asphalt mixture manufacturing process. This second technology has been used for many years in Europe and recently some trials have been conducted in South East Asia successfully.

With “Dry Process”, the effects of plastic modification are better evaluated by measuring the asphalt mix’s performances. Indeed, laboratory studies have demonstrated that adding selected recycled plastic significantly increased the stiffness and rutting resistance of asphalt binders and mixtures, and thus, had the potential to improve the performance of asphalt pavements and extend their service lives. However, the limiting factor is generally the risk of making the mix fragile at low temperatures and causing thermal cracking.

Sustainable Crumb Rubber Modified Asphalt Surfacing for Local Government Application

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ABSTRACT

Logan City Council is endeavouring to lead and demonstrate best practice towards improved environmental outcomes i.e. lowering carbon footprint, recycling and minimising waste. Re-use of waste vehicle tyres, construction and demolition (C&D) material and deteriorated/oxidised asphalt are potential opportunities that recently have made available and are in line with Council's long-term vision to be an innovative, dynamic city of the future.

This paper presents the outcomes of the demonstration trials and application of two proprietary asphalt products that incorporated recovered materials from traditional waste streams to selected sites in Logan City Council road network. The trialled asphalt products were designed to provide enhanced durability and performance properties while being 100% recyclable and contribute to providing sustainable solutions and delivering best value for money outcomes.

The trialled asphalt products were designed and constructed by two of Council's Tier1 asphalt contractors. Through external funding provided by Tyre Stewardship Australia (TSA), extensive laboratory testing was conducted both on the binder components and the asphalt mixes to evaluate their performance and suitability for local government applications. Emission monitoring was also carried out on both trials to address concerns regarding any potential risks to the construction crew and the general public. The results of the laboratory testing and emission monitoring during construction will be presented and discussed in this paper.

Keywords: sustainable construction, recycled materials, crumb rubber modified asphalt, asphalt durability, recycling, asphalt performance

Reaction mechanisms of silane based adhesion promoters in asphalt mixes and emulsions

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ABSTRACT

The asphalt and construction industry is faced with developments in silane based adhesion promoters or anti-stripping agents in recent times. The fatty silane chemistries need to be understood to fully benefit from what they offer and avoid potential pitfalls and/or "side effects". The fatty silane technology is already spreading from asphalt mixes to various bitumen emulsions. "Nano modified emulsions (NME)" and "Nano-Binders" are terms that are now used by academic researchers and marketers, what chemistries are behind the use of these terms in products and applications?

The knowledge on how silane additives work before and after applications can help to choose the right type of chemistry for asphalt mixes and emulsions (cationic, neutral or anionic). Apart from fatty silane's own performance, understanding synergies between traditional anti-stripping agents e.g. amines and hydrated lime, and silane additives can further enhance the development of more robust solutions to extend pavement performance.

Assessment of Asphalt Cracking using High-Speed Photography

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ABSTRACT

Cracking is one of the dominant failure modes in asphalt pavements. These cracks can broadly be classified as structural (bottom up), environmental (bottom down), reflective, or due to excessive deformation (parabolic, shoving). Fatigue crack resistance of asphalt mixes is commonly determined, but the failure is defined as a reduction of stiffness and the actual cracking is not assessed. A number of tests have been developed to measure cracking in asphalt samples, but not widely used as standard tests. Most of these tests only consider one aspect of cracking, e.g. the first observation of the crack, peak loading, slope of the load-deformation curve after the peak. An improved understanding of the crack characteristics and quantification would be beneficial in assessing asphalt mixes with recycled materials, glass and modifiers and in providing optimised pavement thickness solutions, particularly in pavements with cemented layers.

In order to further the understanding of asphalt crack development and characteristics a study was initiated to use ultra high-speed photography techniques to evaluate the crack propagation in a range of asphalt mixes and to consider crack assessment principles used in rock testing. The indirect tensile splitting test (ITS) is widely used in the testing of asphalt properties and was selected as test for the evaluation of cracking. The measurements and observations include crack initiation, crack pattern (i.e. development of tensile and/or shear cracks), and stress level. Several types of asphalt mixes were tested at different temperatures. Results indicate that macro (visible) tensile cracks could appear at stress levels below the maximum peak stress in the stress-strain domain during an ITS asphalt test.

The paper will provide a summary of tests available to quantify cracking in asphalt samples, describe the ITS and ultra high-speed photography procedure and set-up used to initiate and measure cracking, and present the findings.

Net Generation Sprayed Seals

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ABSTRACT

Sprayed seals are a cost-effective wearing course that are commonly used on granular pavements carrying a wide range of traffic volumes. Victoria has traditionally used granular pavements surfaced with sprayed seals on rural highways and freeways. However, it has been observed over several projects on highly trafficked roads that conventional seal treatments have been prone to defects including flushing and bleeding. These distress modes lead to a loss of surface texture and reduced skid resistance, negatively influencing the life of the surfacing and road safety outcomes.

Increased traffic levels combined with variable pavement construction quality has meant the performance of sprayed seals are extremely sensitive to traffic loadings and pavement preparation, and consequently have become increasingly difficult to place successfully as a treatment for new works.

To contribute to addressing these issues, the Department of Transport has applied innovative 'next generation' concepts that aim to:

- increase seal life
- cater for the variable pavement preparation practices to reduce the risk of bleeding and flushing, and
- improve waterproofing of the granular base course.

This paper describes the background and development of the next generation sprayed seal concepts and field trials of these robust wearing courses. Whilst there is an additional cost to the initial capital investment, a reduced need for maintenance interventions and longer seal life overall has the potential to reduce whole-of-life costs. The preliminary field trials of next generation sprayed seal concepts have shown significant potential for improving the performance compared to conventional sprayed seals on highly trafficked roads.

Fatigue Performance Assessment of Asphalt Mixes

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ABSTRACT

A range of asphalt mixes including those with EME2, polymer and straight run binder were characterised in the laboratory to determine pavement design criteria for tensile fatigue cracking and rutting/deformation. Four point bending fatigue and master curve modulus tests following Austroads test method AGPT-T274-16: *Characterisation of Flexural Stiffness and Fatigue Performance of Bituminous Mixes* were conducted to obtain modulus and fatigue criteria for design which required the testing of 22 beams.

Beam fatigue tests were also conducted at two additional temperatures following Queensland Transport Main Roads Technical Note TN167: *A New Approach to Asphalt Pavement Design* for an EME2 asphalt mix to compare fatigue criteria and resulting design thickness with the Austroads method. Results of the fatigue tests were compared in example pavement designs to determine the thickness of asphalt needed for each mix to obtain the same design life or for the same thickness the design life obtained.

To determine a vertical compressive strain criteria for predicting rutting under slow and stationary loads at intersections the asphalt mixes were tested at 40 and 56 °Cat 4 Hz in the Repeated Load Triaxial apparatus following the NZTA T15 Specification being an established method to calculate rutting for aggregate layers within the pavement following NZTA Research report 429: *Development of a basecourse/sub-base design criterion*. It was found that any measurable deformation only occurred at elevated temperatures and long loading times (for example 40 °C and stationary time of 10 seconds) and to predict rutting in design the modulus from the master curve needed to reflect this worst case loading scenario.

This rutting assessment for slow or stationary vehicle loading showed superior performance for the asphalt mixes with EME2 and polymer binders compared to the asphalt mixes with straight run bitumen and was found to be a better distinguisher of rutting performance compared with the wheel track rutting test. Results from this fatigue and rut performance testing are presented in this paper along with comparative pavement designs using the fatigue and rutting criteria found from the testing.

Keywords: EME; EME2; High Modulus Asphalt, Asphalt Rutting, Fatigue, Master Curve Modulus, Four Point Bending, RLT, Repeated Load Triaxial.

The Performance of EME2 under Queensland Conditions

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ABSTRACT

In 2012–13, the Austroads project TT1353 "Asphalt properties and mix design procedures" investigated the potential transfer of French high modulus hot mix asphalt technology, known as enrobés à module élevé Class 2 (EME2) to Australia. EME2 asphalt is a high modulus asphalt technology with potential to reduce base course layer thickness, cut costs, and help to build stronger and long-lasting roads as a move towards perpetual pavements.

In February 2014, Brisbane City Council was a partner in the first application of EME2 technology in Australia when it was used on a demonstration project on Cullen Avenue West, Eagle Farm. Since that time, Council has undertaken regular Falling Weight Deflectometer (FWD) testing of the pavement to monitor the performance and the effects of temperature on the in-situ mix stiffness under Queensland conditions.

Council is continually seeking to improve the network and provide value for money for ratepayers by using innovative pavement materials and testing methods to drive efficiency. Following the successful Cullen Ave West demonstration, Council developed its own EME2 mix design which is typically used in area with high levels of industrial traffic. The implementation of this technology has been supported by an on-going test program. Flexural modulus and fatigue master curves that can be used for EME2 in future pavement designs were developed by testing four-point bending beams in accordance with Austroads and NACOE procedures.

A new presumptive modulus and fatigue relationship for EME2 mixes in Queensland

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ABSTRACT

Enrobés à Module Elevé Class 2 (EME2) is an innovative high-modulus asphalt originally developed in France during the 1970s. It has exceptionally good fatigue resistance and together with its high modulus is an ideal material for use as a basecourse in heavy duty asphalt pavements. This technology was recently transferred from France and has been implemented on several major roads in Queensland

Queensland Department of Transport and Main Roads (TMR) currently design the thickness of EME2 layers based on the presumptive fatigue relationship for generic asphalt mixes recommended in the Austroads Guide to Pavement Technology. However, this presumptive relationship was originally developed based on laboratory fatigue testing of a limited number of conventional asphalt mixes in Europe and the USA and may not resemble the fatigue behaviour of locally manufactured EME2 mixes.

TMR and the Australian Road Research Board (ARRB) previously developed a methodology that allows for mix-specific asphalt modulus and fatigue relationships to be used as input into the Austroads asphalt pavement design procedure. This methodology, as documented in Technical Note 167 *A New Approach to Asphalt Pavement Design,* allows pavement designers and asphalt suppliers to design asphalt layers based on mix-specific information and take advantage of the performance benefits that innovative materials such as EME2 has to offer.

The methodology in Technical Note 167 was used in a recent National Asset Centre of Excellence (NACOE) research project to characterise five locally manufactured EME2 asphalt mixes in the laboratory to develop a new presumptive flexural modulus and fatigue relationship that could be used for the structural design of EME2 layers in Queensland.

This paper presents the findings of the laboratory testing undertaken and provides a case study that demonstrates how TN167 could be used to develop new presumptive modulus and fatigue relationships based on mix-specific testing for asphalt pavements in Australia and New Zealand.

Keywords: EME2, pavement design, modulus, fatigue, mix-specific, presumptive relationships, Queensland, NACoE.

Laboratory Performance of Crumb Rubber Modified Binders in Australia

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ABSTRACT

Millions of tyres reach the end of their life in Australia annually. These end-of-life tyres is considered a valuable resource that has a proven history of improving the performance of bituminous binders used in sprayed seals and asphalt mixes.

The Queensland Department of Transport and Main Roads (TMR) and the Australian Road Research Board (ARRB) have developed a new technical specification for the manufacture and placement of crumb rubber modified (CRM) open graded and gap graded asphalt surfacing layers. It is envisaged that this new specification will facilitate the increased use of recycled end-of-life tyres whilst providing improved performance over conventional asphalt mixes.

The CRM binder properties adopted in the new specification were primarily based on the binder requirements in Arizona and California where these binders have a long history of proven performance. However, some binder and crumb rubber properties had to be adjusted for the Australian context and the binders used in the USA where therefore not fully replicated in Australia. Subsequently, concerns were raised that the locally manufactured CRM binders may not necessarily achieve the same levels of performance as the international binders.

In response to these concerns, a National Asset Centre of Excellence (NACOE) research project was initiated to benchmark the laboratory performance of three locally manufactured CRM binders against the performance of two binders sourced from California. The laboratory program included a number of binder performance tests, as well as assessing the deformation and fatigue resistance of the different CRM binders in a gap graded asphalt mix.

This paper presents the findings of the benchmark performance testing undertaken to date, including whether locally manufactured binders exhibit similar performance in the laboratory to those sourced from California.

Keywords: End-of-life tyres, crumb rubber, crumb rubber modified binder, open graded asphalt, gap graded asphalt, performance tests, deformation resistance, fatigue resistance.

Development of a low viscosity S45R binder which can be sprayed without cutter Abstract

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ABSTRACT

Australian Road agencies have been using Crumb Rubber modified bitumen in road construction since the mid 1970s. Crumb rubber modified Bitumen's have consistently demonstrated they provide improvements in aggregate retention, crack minimisation and noise reduction of flexible pavements. The need to improve Australia's use of Crumb Rubber is growing more acute with the increasing focus on recycling and the increasing problems with disposal of waste tyres. Typically crumb rubber is a high viscosity product that needs a significant quantities of cutter to ensure good spraying and proper wetting of the aggregate. Our goal was to develop a crumb rubber binder that met all the requirements of S45R but enabled spraying with no cutter. This would enable cost savings as well reducing the impact on the environment by eliminating the release of waste hydrocarbons. We have successfully developed this product and it was now been used in Victoria on 1000s of km of road including spraying in winter. The product has exceeded all our expectations and has been used in a new combined bitumen sprayer chipper spreader that is being used by Primal Surfacing.

Towards storage stable hybrid recycled modified bitumen with waste plastics

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ABSTRACT

The application of polymer modified bitumen (PMB) using waste plastics is gaining attention as it provides waste disposal solution, therefore supporting sustainable construction. However, it is only feasible on large-scale projects if phase separation is prevented and the properties of the PMB are maintained during storage and transportation. The main objective of this research was to investigate the effectiveness and feasibility of utilizing different compatibilizers towards storage stability of hybrid PMB which combines styrene-butadiene-styrene (SBS) and recycled polyethyelene (RPE). The hybrid bitumen was prepared by blending 3% SBS and 3% RPE with three different compatibilizers. The experimental program included softening point, fluorescence microscopy, chemical characterisation, and rheological properties at the low and high-temperature range. The phase separation results demonstrated that without any compatibilizer, the polymers have separated from bitumen during the 48h storage stability test. However, the utilization of the compatibilizers has positively improved the storage stability of the hybrid PMB to a noticeable extent. The addition of compatibilizer has created a chemical interaction between the physically combined base bitumen and polymers. Moreover, the rheological results indicated a comparable performance between the hybrid PMB and commercial grade PMB.

Keywords: hybrid polymers, compatibilizer, asphalt, bitumen, rheology

Performance-based specifications for crumb rubber modified bitumen

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ABSTRACT

This study explores the performance changes of crumb rubber modified bitumen subjected to several blending and testing conditions. The results are expected to contribute towards the development of performance-based specifications for crumb rubber (CR) modified bitumen. Mixing duration (from 30 to 90 minutes), shear mixer speed (from 700 to 3500 rpm), mesh size of the rubber particles and CR concentration (from 7.5% to 22.5% by weight of the bitumen) were all analysed in terms of the physio-chemical, thermal and rheological response of the modified binder. Standard bitumen tests included in ATS3110 were also conducted. A mixing duration of approx. 60 minutes was found to be enough to swell rubber particles although a further increase in mixing time breaks the polymeric chains and deteriorates the properties of the blend. Increasing the shear mixer speed helps reduce the time required to fully swell the rubber particles although excessive shear rate can produce relatively stiffer blends due to ageing. Storage stability was also assessed and some new compatibilizers were investigated. It was found that blends with low CR concentration benefit from the use of compatibilizers. Lastly, asphalt mixtures prepared with 7.5, 15 and 22.5% of CR modified binders were evaluated for rutting and fatigue performance. This range of CR concentrations helps adapt asphalt mixtures for different field applications (i.e. from local roads to medium-high trafficked roads).

Crumb Rubber Digestion

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1. *ARRB*

ABSTRACT

The use of crumb rubber, sourced from truck tyres, to modify bitumen for use in spray seal applications has been standard practice in Western Australia for approximately 40 years. In recent years crumb rubber modified binder has been used in asphalt as well. It is documented in literature that the reaction of the crumb rubber and bitumen is affected by:

- the temperature of the binder
- the surface characteristics of the rubber particle
- the size of the rubber particle
- the period for which the rubber and bitumen are kept at the reaction temperature

Main Roads have identified a need to have a greater understanding of the effects of these factors on the rheological properties of the CRM binder, particularly in the WA context. Having this understanding will assist with the quality of the CRM binder, improve storage requirements/limits and maximise the potential performance improvements.

This presentation will provide an overview of the Western Australian Road Research and Innovation Program (WARRIP) project currently examining the digestion of rubber at two different temperatures, two different gradings and six different times from 1 hour to 36 hours. The project is not only investigating the rheological effects of digestion but also the chemical and physical changes of the modified binder during digestion.

NCAT Research on Balanced Mix Design for Asphalt Mixtures

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ASTRACT

Balanced mix design (BMD) is a new era of mix design and quality assurance system for asphalt mixtures. BMD is defined as “asphalt mix design using performance tests on appropriately conditioned specimens that address multiple modes of distress taking into consideration mix aging, traffic, climate and location within the pavement structure.” BMD typically includes two or more performance tests such as a rutting test and a cracking test to assess how well the mixture resists the two common forms of distress. Different from the traditional volumetric mix design approach, BMD requires agencies to check the end product instead of specifying volumetric requirements. End-product testing motivates mix designers to use innovative materials and technologies to design asphalt mixtures and provides agencies with a more reliable way of accepting mixtures for asphalt pavements. Over the last few years, the National Center for Asphalt Technology (NCAT) has been leading the research development, education, and implementation of BMD in the United States. NCAT researchers have been leading numerous national and state-level studies to develop a framework for BMD, conduct statewide benchmarking and interlaboratory studies, construct multi-phase accelerated pavement testing experiments, and develop a Roadmap and Resource Guide document for state highway agencies and the asphalt paving industry. Research findings of completed studies along with high-priority questions being investigated in the ongoing studies will be presented.

Intelligent Compaction for Asphalt Pavements

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ABSTRACT

Intelligent compaction (IC) technology has been increasingly used in road construction projects in the US and Europe while this technology is progressively adopted in Australia. Although IC can provide real-time data with 100% coverage, the data provided by IC through 'intelligent compaction measurement value' (ICMV) commonly fails to correlate well with the asphalt density. Based on the literature review, it was found that the influences of the underlying support and varying asphalt temperature on ICMV during asphalt compaction are found to be the main reasons for this poor correlation. Through an online questionnaire survey undertaken by the SPARC Hub, it has been found that more road construction companies in Australia are willing to use IC if an acceptable correlation between ICMV and asphalt density is demonstrated and a comprehensive standard for IC is developed. Therefore, SPARC Hub IC research team is currently working on improving the ICMV-asphalt density correlation by decoupling the influence of underlying support and asphalt temperature on ICMV during asphalt compaction. After validating the proposed corrections for these factors with demonstrated field trials, IC specification for asphalt pavements will be developed for use in practice.

Recycled plastic in Polymer Modified Asphalts for Hot Climates

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ABSTRACT

Road network across regions with hot climates in Africa, Middle East and Europe experiencing increase of traffic as well as increase in axle weight. Highways are being subjected to repeated loadings, which can cause failures and distresses if the engineering criteria are not fulfilled. In order to keep pavements at sufficient service level, design and maintenance plays important role during the life cycle cost. Special attention has to be given to the road performance at high temperatures. In this case, the critical factor is right selection of the bitumen. It has been proven that usage of polymer modified bitumens has extended the pavements life time and other benefits can be described as reduction of rutting and fatigue, minimization of ageing effects including bitumen hardening.

In the era of sustainability and recyclability usage of post industrial polyethylene material is essential. This presentation brings various examples from three different continents and discuss potential for blending recycled plastic with bitumen. Combinations of various loadings with and without conventional polymers is discussed, wet process is considered. Results are based on softening point, penetration, viscosity and performance grading system, depending on the regional specifications. Storage stability of polymer modified blends is also discussed. During the presentations all mentioned topics above will be debated and the state of the art of polymer modified technology at different regions will be compared. Incorporation of recycled polyethylene is applicable and convenient in hot climates, but empirical specifications shall reflect such material with all benefits and disadvantages.