

Sustainable process gathers pace after a good start

Use of a low energy method of asphalt manufacture is gathering momentum as a growing list of highway authorities get sight of the resulting lower temperature materials.

Temperatures at which asphalt is produced can be reduced dramatically, to provide benefits including greater environmental sustainability, via any one of a number of different techniques. For some companies and an expanding list of their clients, the preferred method is the Low Energy Asphalt (LEA) process, due to the proven performance of the resulting materials in practice.

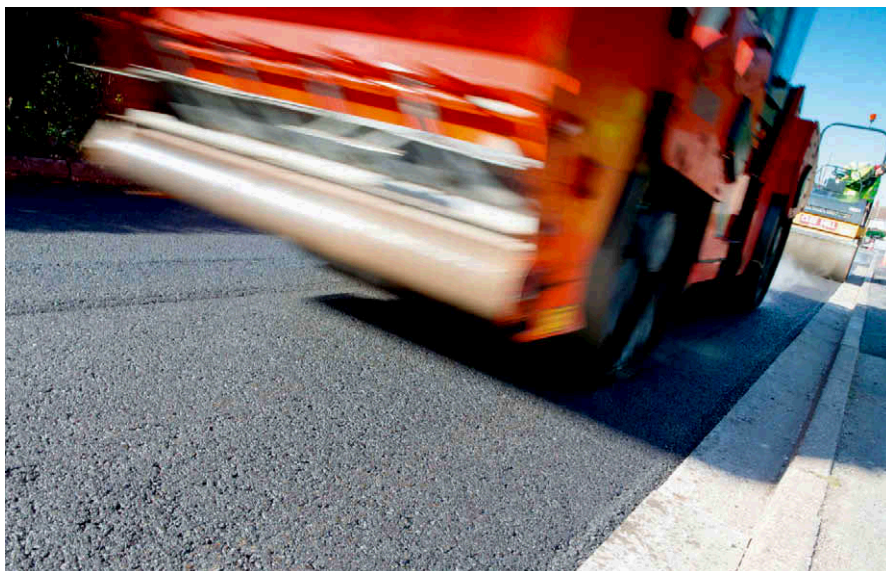
LEA – introduced to the UK under license from France by the bitumen supplier Petroplus – features a sequential foaming procedure, producing asphalts that meet the BSEN13108 standard. It does so at temperatures of just below 100°C, reducing fuel consumption and the carbon emitted during asphalt mixing by up to 50% (hot mix is typically produced at 160°C to 180°C). Performance of the resulting pavement

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Tony Zigler

layer matches that of hot mix equivalents and it looks exactly the same as the asphalt materials highway authorities are used to seeing.

Asphalt suppliers report these benefits as crucial in proving the material to their customers. The generally conservative UK asphalt market has historically been slow in accepting materials innovations. With take up of lower temperature asphalts the UK is again lagging behind other countries – notably North America where 43M.t of ‘warm



Low Energy Asphalt materials match the performance of hot mix equivalents

mix’ materials were produced last year (see box). LEA has all the attributes necessary to help the UK catch up.

Midland Quarry Products is one of a number of companies to have adopted the LEA process for offering clients greater sustainability. Hanson is another. Both say the fact that LEA conforms to latest standards and that they can reproduce virtually all of their hot mix products in LEA form, is another crucial factor in their selection of LEA.

“The key benefits of LEA are that the material, in comparison to hot mix, demonstrates like for like performance under testing, but with less fumes and substantial carbon savings, and it looks and lays the same as hot mix,” says Hanson’s Technical Services Manager Tony Zigler.

MQP’s vision is to become the lowest carbon supplier in the industry while still maintaining its focus on product durability.

“It’s essential as an industry that we drive down the carbon content of our products as we move towards a low carbon economy,” says MQP’s Managing Director, Simon Willis. “We aim to stay at the forefront of durable low carbon asphalt development.”

Furthermore there is the crucial question of cost for asphalt suppliers and their customers. Petroplus Business Development Manager Gareth Evans says: “We are moving away from just showing that LEA works. It meets existing standards and virtually all in the asphalt sector are aware that it matches hot mix in terms of performance. Key for us now is demonstration that LEA is more cost effective than other methods of reducing asphalt temperature.”

Up to 50% of the stone fraction in LEA asphalt can be recycled asphalt pavement (RAP), although the optimum quantity for energy efficiency is nearer 30% (a higher

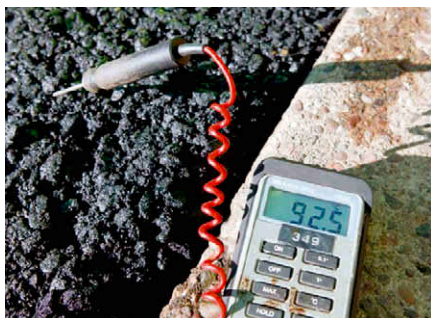


A Staffordshire pilot of the Low Energy Asphalt process proved a success. Over 7500t of the material has been supplied in the county this year

proportion demands heat for drying). This compares to an upper RAP limit of 20% in hot mix base and binder courses, and a 10% limit in conventional surface courses.

LEA reduces fuel consumption and can enable less primary aggregate consumption. This adds up to sizeable savings over investment in RAP drying and temperature reduction methods, such as those involving mix additives which only add to production costs.

Staffordshire County Council and its highway maintenance partner Enterprise, for instance, have been through a process of trialling LEA with Midland Quarry Products. The county now uses the materials at all sites within economic range of MQP's production plants. MQP has supplied over 7,500t of LEA to Enterprise in Staffordshire



Asphalt is produced at temperatures of just below 100°C, reducing carbon emissions and fuel consumption by up to 50%

this year, as well as a number of sites with Amey in Birmingham, the borough councils of Walsall, Dudley and Sandwell, and Leicestershire.

Hanson meanwhile has carried out LEA projects with clients including Atkins in Cambridgeshire and the South Wales Trunk Road Agency (SWTRA). The Atkins job – at Great Staughton in Cambridgeshire – applied an LEA stone mastic asphalt (SMA) surface course 45mm thick.

"We are pushing the technology forward," says Tony Zigler. "The material compacted well, which is critical and achieved the desired low void content. We hit everything we were aiming for." The low temperature SMA was laid alongside a new layer of a conventionally produced equivalent for comparison. "We were able to open up the LEA carriageway within 20 minutes, whereas the hot mix section remained closed for a further two to three hours," says Zigler.

Hanson has also developed an LEA hot rolled asphalt to show that a low temperature HRA can be produced successfully. In the process of these development projects, Hanson is proving LEA can be applied to different types of aggregate. "This is allowing us to make good use of sources local to each surfacing scheme, maximising environmental benefits," Zigler says.

For SWTRA, a limestone AC20 dense

binder course was produced using LEA with 25% RAP in the mix, laid 80mm thick on the A40 at Abergavenny. Around 500t was supplied initially and now Hanson is doing further LEA work with SWTRA. "Welsh authorities have been very receptive," Zigler adds. "Any concern over risk has been satisfied with full materials testing. We have proven we can get it right. Use of LEA is accelerating."

NAPA President sticking to his guns

President of North America's National Asphalt Pavement Association (NAPA) Mike Acott has reiterated his expectation that the United States' entire asphalt market will switch to low temperature asphalt. He has previously been reported as saying this is likely to happen within five years. Acott was at a joint meeting of NAPA and its European equivalent EAPA recently. He stated that the US "is on a steep curve of progress with warm mix asphalt".

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