

Total Bitumen

Standing out from the crowd

Results of a long term European study have confirmed what Total Bitumen already knew – that its Styrelf material is one of the best performing polymer modified binders.

Polymer modified bitumen (PMB) binders are not necessarily a panacea for producing high performing asphalt materials: there is as much variation across different PMBs, in terms of ageing characteristics, as exists between all types of modified or standard penetration grade bitumen.

Some PMBs perform better than others. UK highway authorities should be aware of this from their varying degrees of success with thin surfacings; and the facts have been confirmed by an academic study carried out in Switzerland.

Lausanne University has compared the performance of 16 asphalt road surfaces over a 14-19 year period (only the best performing materials were studied over the full term); all were similar standard designs but contained binders from Europe's principal suppliers of differing penetration grades, additive enhanced formulations or PMBs.

Total Bitumen is very pleased with the results because its Styrelf binder has been shown to be one of the very best performing of European PMBs. During the

study, carried out for the Swiss national road federation, participants received reports that gave results of all 16 binders but only identified outcomes from products of that particular company.

"The study focused on ageing performance and how asphalts containing

"The new Styrelf product range will meet market needs, with specific grades for particular applications. Based on the Styrelf form of polymer modification, these products will provide certainty of long term durability." Rick Ashton

each binder would stand up to the rigours of climatic conditions. The 16 asphalt test sections were located together in a mountainous area where temperatures reach extremes in summer and winter months. They were on a very open site with the materials exposed to extremes of

thermal stress and high levels of oxidising and UV light ageing," says Total Bitumen Technical Manager Gary Schofield.

"It is very evident from the study, particularly its 'cracking index' results, that the performance of some of the PMB binders was worse than the standard penetration grades.

"The fact that a material description contains the term PMB does not mean that that binder will be a good product for all applications. Some authorities are just specifying a requirement for any PMB asphalt without attaching any specific performance criteria to that."

According to the final Lausanne University report, the asphalt containing Styrelf was the only material to exhibit zero cracking. "The Styrelf section is also the only strip of road surface in the test location to still be in place without needing resurfacing 21 years after the study began," Schofield says.

Styrelf is the product of a great deal of PMB research and development in France. Like some other PMB binders, Styrelf contains a styrene-butadiene-styrene (SBS) polymer, but with a crucial difference in manufacturing technique. Total Bitumen 'cross links' the individual SBS polymer strands.

"Conventional methods involve mixing bitumen with polymers through a physical blend, resulting in large polymer strands dispersed in the PMB binder," Schofield says.

"We put a cross linking additive in, which creates a single network of interlinked polymer molecules. This gives greater elasticity and toughness. Because



Results from the Lausanne study of binder performance, particularly 'cracking index' results, showed great variation between different polymer modified binders. Some PMB binders (above left) performed poorly in comparison to standard penetration grades. The Styrelf section is shown above right

TOTAL BITUMEN PRODUCTS: SUSTAINABLE, DURABLE AND LOW TEMPERATURE

Sustainability



Durability



Lower Working Temperatures



Total Bitumen's UK marketing strategy is based on three cornerstones of 'durability, sustainability and lower working temperatures'. The key message is that the company has a wide range of products available to meet each of these demands.

Longevity of service is a key element of Total Bitumen's Styrelf PMBs and its Emulsis range of polymer modified surface dressing binders. Longer lasting materials present the least long term environmental impact. "Sustainability is inevitably linked with durability and lower working temperature," says Total Bitumen's National Sales & Marketing Manager John Tuite.

Total's Emulsis binders are applied 20°C lower than conventional surface dressing

materials and have a "lower CO₂ footprint", Tuite says. "Surface dressing is cost effective, but is it always sustainable and good value for money? It is if applied correctly with the right materials.

"One of the main arterial routes leading into Preston was surface dressed using the Emulsis premium grade binder and has since provided a durable surface for a length of time double its expected design life. That level of value speaks for itself."

Qualities of sustainability also come via Total's Kromatis clear binder – Kromatis asphalts laid to provide light and partially reflective carriageway surfaces have been proven to reduce the need for street lighting by 50% – and the firm's Biokromatis product, which incorporates renewable materials.

Reduction of 'working' (mixing and laying) temperatures of asphalt is advocated principally for benefits of smaller carbon footprints. There are a number of ways of achieving the heat reduction.

Total's answer is its Azalt ECO² binder, which has been proven in France and is now due to be launched in the UK. Asphalt temperature is reduced by 40°C with no mixing or laying plant modifications necessary.

"There are clear environmental benefits to this heat reduction, but also practical improvements in application," says Total Bitumen's UK Market Development Manager Rick Ashton.

"Less temperature means shorter cooling times, greater productivity and more rapid completion of surfacing projects."

Styrelf is cross linked, availability for bonding with oxygen is much less. Ageing through oxidation still occurs, but at a much slower rate."

Styrelf is a vital part of plans that promise to make this an important year for Total Bitumen in the UK. Trials of asphalt mixes incorporating the company's 'warm mix' binder Azalt ECO² are being developed (see box) and a new range of asphalt binders based on the fundamental Styrelf PMB formulation is due to be launched later in 2011.

Total Bitumen's National Sales & Marketing Manager is John Tuite. He says: "Naturally, we are very pleased with the results of the Lausanne study, which has backed up what we have believed for a long time. As a consequence and not

wishing to rest on our laurels, we wanted to look at where we are with our Styrelf grades and overall offer to the market. Announcements on specific new products will come in following months."

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According to Total Bitumen's UK Market Development Manager Rick Ashton, "absolutely identifiable market segments" have emerged during recent years, particularly over the past 12 months.

Where roads are being improved and managed via PFI or privately financed DBFO contracts, the focus is on objectives of long term durability and whole life cost. Immediate costs are critical where local authorities have dwindling budgets for dealing with problems of potholes and deteriorating road condition.

"The new Styrelf product range will meet market needs, with specific grades for particular applications. We will work with asphalt suppliers to develop a PMB binder that fits their needs," Rick Ashton says. "Based on the Styrelf form of polymer modification, these products will provide certainty of long term durability."

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