

Shell Bitumen

Market conditions turn favourable for warm mix

Shell Bitumen has more than 10 years of experience developing its warm mix asphalt process Shell WAM® Foam, which is now set to help answer emerging needs.

Demand is growing for asphalt solutions that can help reduce energy consumption and lower emissions. Launch of asPECT (the asphalt Pavement Embodied Carbon Tool) at the Asphalt Industry Alliance conference Carbon Innovation Ahead in October 2009, plus a rapidly changing 'carbon landscape' means asphalt suppliers are increasingly looking for lower energy options.

Shell Bitumen recognises this need. For many years, Shell has been making use of research and development resources to find new technologies. One example is the Shell WAM® Foam process, which helps asphalt

manufacturers to produce and lay asphalt at lower temperatures than conventional hot mix without compromising the performance of the resulting road surface.

Shell Bitumen's technical service manager Lee O'Nions says: "Producing asphalt using the Shell WAM® Foam process consumes less energy than conventional hot mix asphalt.

"Asphalt is mixed and manufactured up to 60°C lower with the Shell WAM® Foam process, in comparison to conventional hot mix, which offers a considerable saving in carbon dioxide emissions of up to 35%."

The Shell WAM® Foam process is suitable

for use in all layers including surface courses. It is produced by mixing together soft and hard grades of bitumen with aggregate.

The soft binder is mixed with the aggregate to precoat it and then the hard bitumen is introduced to the mixture as a foam. Asphalt produced in this way can be made to a range of penetration as with traditional hot mixes.

As there are no additives involved in this process there should be no specification barrier to use of Shell WAM® Foam in comparison to alternatives that make use of chemical or organic additives as referenced in the European Asphalt Pavement Association

CARBON TRADING EXPLAINED

The Carbon Reduction Commitment Energy Efficiency Scheme (CRCEES) will operate as a 'cap and trade' mechanism, providing a financial incentive to reduce energy use by putting a price on carbon emissions. It will apply to all UK companies or organisations whose half hourly electricity consumption exceeds 6,000MWh during 2008, or have at least one electricity meter settled on the half hourly market. The UK Department for Energy & Climate Change has estimated around 5000 organisations will fully qualify and around 20,000 large public and private sector organizations will be involved in some way.

Monitoring and reporting begins for the CRCEES in April 2010 with trading starting in 2011. Organisations will buy credits relating to their annual emissions. Reduction targets will



Shell Bitumen has extensive experience of Shell WAM® Foam projects in Europe

be set by placing a 'cap' on the total allowances available to each group of participants. Money raised will be recycled back according to performance against the targets, which will be ranked in an annual league table on energy efficiency.

With this incentive on its way, there is much Shell Bitumen's UK business can learn from

customers and trials elsewhere in Europe. Shell's Swiss business manager Felix Lichtsteiner says: "My customers have always been keen to ensure good performance in a product. Now they can also take advantage of the financial and environmental benefits afforded by low temperature options. Shell Bitumen can help them achieve success".



Shell Bitumen's warm mix process Shell WAM® Foam offers carbon emissions savings of up to 35% and produces asphalts suitable for all pavement layers

position paper *The Use of Warm Mix Asphalt* in June 2009.

"Blending grades of bitumen for use in asphalt is not unusual," says O'Nions. "But in the Shell WAM® Foam process, the two grades of binder need to be injected separately into the asphalt mixing plant. To achieve this, a specially designed foam bar is attached to the mixing plant to deliver the correct quantities of binder at precisely the right time."

According to O'Nions, asphalt manufactured using the Shell WAM® Foam process is produced to a similar recipe as conventional hot mix asphalt and no special variety of aggregate or filler materials are required. Clients can make use of secondary aggregates, recycled asphalt plantings or crushed glass in the mix.

A patented process, Shell WAM® Foam was first started in 1995 in conjunction with Norwegian contractor Kolo Veidekke in Norway. Since then, more than 90,000 tonnes of asphalt mixtures using the Shell WAM® Foam process have been laid in trials and commercial jobs throughout Norway, Switzerland, Italy and the UK, each demonstrating that WAM® foam mixtures give equivalent performance to hot mix asphalt in different road categories and in different climates.

One specific trial in the UK has been

carefully monitored by O'Nions. "This UK road has performed well over the years. The site has been checked over time and cores taken; the road is performing at least equivalent to that of a hot mix asphalt."

In 2008 the Swiss government distributed carbon allowances to companies that opted out of a national CO₂ levy on heating fuels in favour of an emissions trading scheme.

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Felix Lichtsteiner

"In the last three to four years we've seen an increase in customers' interest in low temperature options, but incentive to use these innovations was low," says Shell's business manager for Switzerland Felix Lichtsteiner. "Today, partly as a result of recent increases in taxation, low temperature technologies are becoming increasingly recognised in Switzerland as attractive solutions which not only help reduce energy consumption and emissions efficiently, but in turn, reduce fuel and tax costs.

"Since 2008, customers are increasingly coming to Shell as the Shell WAM® Foam process is one of the few solutions that enable them to continue to use the same recipes, which is a big benefit to them. Industry working groups have been set up to accelerate implementation and we expect to see an even bigger increase in use of warm mix asphalts by 2011."

Although in the UK there may have been less financial incentive to encourage use of lower temperature solutions, from April 2010 the Government is introducing mandatory carbon trading which may give UK highway authorities, their contractors and asphalt suppliers monetary reasons to consider lower temperature solutions.

The Government initiative, the Carbon Reduction Energy Efficiency Scheme (CRCEES), is designed to encourage large organisations to reduce their carbon footprint. Firms exceeding an annual carbon emission target will be penalised while well performing businesses will be rewarded (see box left). Although it is not clear to what extent organisations within the asphalt industry will be involved, more than 20,000 companies in the UK are expected to participate in some way.

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