

## Shell

# Upping surfacing outputs with Shell S Grades

Shell Bitumen has answered demand for greater volumes of surfacing in limited windows of working opportunity – with addition of S Grade to its bitumen binders.

**M**uch of the UK's pavement surfacing is now carried out at night to keep disruption to a minimum for motorists and flight operators. Restriction on working hours brings logistical difficulty, which has driven Shell Bitumen to develop its Shell S Grades for increasing volumes of surfacing possible in a given time.

Shell's S Grade binders contain an additive that reduces the impact of cooling times on paving operations. Asphalt mixes containing Shell S Grades are more workable at a given temperature – or can be laid at lower temperatures and any Shell binder can be modified to provide the tangible benefits of Shell S Grades.

For surfacing contractors and their clients this is allowing unprecedented levels of flexibility when programming paving work. A trunk road maintenance project in the UK

has benefitted from use of Shell S Grade binders, as has a massive runway reconstruction scheme at Frankfurt International Airport.

"Our chemists originally developed the additive in Shell S Grades for the German asphalt market, for easing pressures on logistics – enabling thicker layers to be laid in short shifts," says Shell Bitumen Technical Development Manager Richard Taylor. "In general, 200-300mm layers of conventional base and binder course asphalt will not cool in time for overlaying with a surface course by morning.

"In Germany it is common to use high performance Gussasphalt mixes, which feature relatively hard bitumen binders and would therefore normally require elevated temperatures to gain sufficient workability. Our customers in Germany are now using Shell S Grades with PMBs (Polymer

Modified Binders) in every layer to maintain workability and high performance at lower temperatures."

Work done at Frankfurt Airport shows what's possible using Shell S Grade binders at the upper end of the project scale. The airport's formerly concrete north and south runways have been completely reconstructed in high performance asphalt to their full depth of 600mm. All of the work was done during night time shifts with the runways returned to operation for flights from 6.00am each morning.

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Richard Taylor

Contractor Kirchhoff Heine Strassenbau (KHS) managed this feat by selecting low temperature asphalt mixes incorporating Shell's S Grade PMBs.

The contractor also worked across instead of along the 4km long and 60m wide runways, reconstructing a 60m by 15m strip each night. KHS broke out the concrete and then laid in its place two 240mm Shell S Grade asphalt base course layers and a 120mm S Grade binder course, which also provided a temporary surface. At intervals of every eighth strip, KHS planed off the top 40mm of the temporary surface and laid a high performance Shell S Grade surface course across a 120m by 60m area.

KHS worked across the Frankfurt runways – reconstructing a 60m by 15m strip each night with asphalts containing Shell S Grade binders





Use of asphalt mixes with Shell S Grade binders made it possible to reconstruct the Frankfurt runway pavement to its full 600mm depth each night

“Full depth reconstruction of a runway, without having to suspend flight operations is unheard of in the UK,” says Shell Bitumen Technical Manager for Europe Andy Self. “Use of low temperature asphalt made it possible. The contractor was supplied all of the night’s 1500t of asphalt pre blended before work started and the mix was laid at 135°C instead of 180°C. That made the critical difference. Three asphalt layers could be laid each night and the top layer cooled in time for trafficking early in the morning.”

Further benefits include less emissions. Lowering asphalt mix temperature by a small amount produces relatively large reduction of fumes, which has led to substantial demand for Shell’s S Grade binders for use in enclosed spaces. The industrial and mastic roofing sectors are the biggest UK markets for Shell S Grades so far, but in the UK highways sector, the market for high performance base and binder courses is growing and pressure is increasing to get more done in a short space of time.

The UK trunk road project that made use of Shell S Grade binders was carried out in 2006 by Lafarge Contracting on the A34 near Oxford. “Lafarge needed to replace several short stretches of carriageway to a depth of 310mm down to sub base. That was a lot to put back in one short shift at night,” says Richard Taylor. “The Highways Agency is very keen to reduce disruption so the project team including Lafarge applied for a Departure from Standard to use Shell S Grades.

“Usually for such a project, a temporary surface course is laid and then replaced the following night. On the A34 a full permanent job was done in one go and everyone was delighted with the results.” Shell is well known for its technical back up and provided an enormous amount of rheological data to support the departure application and asphalt mix design with Lafarge, Taylor says.

“The asphalt plant was quite far from the A34 site, so the materials were mixed at conventional temperatures but laid and compacted at considerably less,” Taylor adds. “There is a real market position for Shell S Grade binders, easing logistics for highway and airfield authorities.”



The top 40mm of temporary surface at Frankfurt was planed off and replaced with a high performance S Grade surface course at intervals of every eighth strip

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