

Nynas Bitumen

Further advances in bitumen binder technology are enabling modern asphalts to stay one step ahead of demands for high performance.

Boosting binder technology to meet demand

Demands imposed by rising traffic volumes and increasing axle loadings, along with the need for performance specification based road surfacings, have all contributed to revolutionising the asphalt industry. High performance bitumen binders have played a key role in the changes over the last decade and continuous binder development is driving forward asphalt performance.

Nynas Bitumen launched a range of new Polymer Modified Bitumen (PMB) binders in the mid 1990s to meet the changing needs of the industry and these have evolved to become the Nypol range. Each of the binders in the range is specially engineered to give them different properties to suit almost any situation where performance is critical.

“PMB binders had been commercially available for some time but when we started development work on Nypol 200 in 1994 it was one of the first of the new generation of modified binders,” says

“Design of all our Nypol binders is continually being refined to ensure they can meet the demands of every application.” **Dr Ian Lancaster**

Nynas Bitumen senior development chemist Dr Ian Lancaster. “Our development work coincided with the Highways Agency’s (HA) decision to move from recipe to performance based mixes on high grade trunk roads and motorways.

“To meet the HA’s new performance specifications for Hot Rolled Asphalt (HRA), use of heavily modified binders, such as Nypol 200, was essential and demand for PMB binders grew from there.”

Introduction of thin surfacings and SMA (Stone Mastic Asphalt) in the UK called for different binders. Nypol TS and Nypol SMA was developed in response. Nypol TS is engineered to be thixotropic, which means that it has shear-thinning properties that allow it to become thinner when mechanical energy is applied, and viscosity to increase when energy levels reduce.

Lancaster explains the benefits of Nypol TS’s thixotropic nature: “During mixing the binder thins out to ease the process, then thickens when placed into vehicles, which prevents binder drainage. It all adds up to make the asphalt easier to produce, handle and lay as well as creating a highly flexible and durable surface.”

Nypol TS was first trialled on the A4 in Bristol in 1998 and has since been successfully used on highways all over the UK including the M74, M8, A30 and A38 (see boxes).

Most recent addition to the range is the highly specialised Nypol HR which was developed to create a scuff resistant asphalt for use on very high stress sites such as tight bends and busy roundabouts. Nypol HR uses a different modifier from the other products in the range to give it greater stiffness without being brittle.

“Nypol HR was originally developed for use on public roads but has also been used on the Graham Hill bend at Brands Hatch and a new Land Rover vehicle proving ground,” says Lancaster. “The product could also work well in industrial applications such as container terminals where traffic speeds are relatively low but the loadings are



Making roads into Cornwall

Tourists visiting Cornwall usually travel into the county on one or other of two major trunk roads, placing considerable strain on these routes. Recent resurfacing on the A38 at Liskeard and A30 near Bolventor called for high performance materials and careful planning to meet durability demands.

Resurfacing on both carriageways was carried out using Bardon Aggregates' Thinpave surfacing bound with Nypol TS to ease construction and improve end performance. Work on the A30 was undertaken by Bardon Contracting, while the A38 contract was carried out by Cormac, Cornwall County Council's direct labour organisation.

Surveys on the A38 had revealed some serious structural problems and Cormac was brought in by the Highways Agency (HA) to carry out selective full depth reconstruction on a 3km stretch of the dual carriageway. Resurfacing on the A30 was necessary to improve safety and Bardon Contracting won the contract from the HA to replace the existing surface course with a layer of Thinpave.

All the asphalt for both contracts was produced by Bardon Aggregates at its Melbur Quarry plant near St Austell. "We had never used Nypol TS before and its application on the A30 and A38 was viewed as a trial, but the production side of the work went very smoothly," says Bardon Aggregates general manager Tom Hilton.



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- 1: Nypol TS was used as a binder for Superhitex on the A30 in Cornwall to improve skid resistance.
- 2: Land Rover's vehicle proving ground was surfaced with Nypol HR to provide a highly scuff resistant finish.

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- 3: Polymers are used to specially engineer the characteristics of each binder in the Nypol range.

high and turning circles tight."

Continual development of all three products is being carried out at Nynas' laboratories in Eastham but Lancaster remains tight lipped about precisely what is under way. "Design of all our Nypol binders is continually being refined to ensure they can meet the demands of every application," he says. "Performance requirements are likely to continue increasing in the future, so development work of this kind is essential."

Nypol proves popular north of the border

Resurfacing on the eastbound M8 between Harthill Services and Whitburn earlier this year was carried out using Nypol TS as the binder for Aggregate Industries' Hitex surfacing. Work on the 4km section of motorway between Edinburgh and Glasgow went very well and was completed ahead of schedule.

Aggregate Industries was called in to carry out full depth reconstruction on the inside lane and resurface the outside lane of the two lane motorway. Two lanes of traffic in either direction had to be maintained during peak hours, so much of the work was done overnight to avoid delays to road users.

"We replaced the binder course on the inside lane with a 60mm thick Heavy Duty Macadam (HDM) and laid a 30mm thick Hitex surface course over both lanes," says Aggregate Industries area manager Ian Waddell. "Using Nypol TS as a binder helps to create a surfacing that is not only workable during construction, but is also very durable."

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