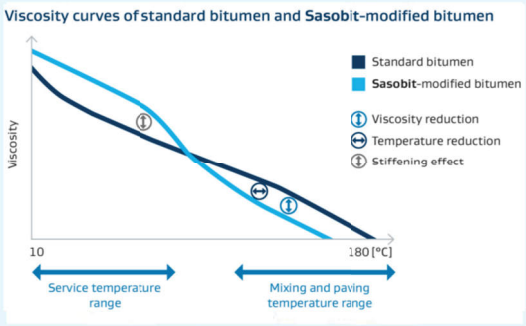
A SMOOTH LANDING:

PAVING THE RUNWAY

Gary Mason speaks to Susann Groß-Matthäi, Manager of Sales & Marketing Asphalt Additives, Sasol Performance Chemicals, about runway resurfacing materials



BACKGROUND

Sasobit is a product of Sasol Performance Chemicals. It is a synthetic Fischer Tropsch (FT) hard wax, produced in South Africa.

Sasobit is the versatile additive for applications in asphalt road constructions which is used successfully since 1997 around the globe.

The image above explains the working principle of Sasobit. At mixing and paving temperatures, Sasobit significantly lowers the viscosity of the bitumen, which allows the lowering of mixing and paving temperatures by as much as 30 °C. In the service temperature range, Sasobit forms a lattice structure in the bitumen, which has a stiffening effect and leads to increased deformation resistance.

1) Surface quality is crucial for airport runways given the high landing speeds of aircraft and the enormous impact loads they place on a runway structure. How do you ensure your resurfacing materials meet this challenge? Asphalt mixes, which include Sasobit, provide a better workability, even during poor weather conditions. Improved workability leads to better compaction, creating more even runways. Even runways mean less bumps and shocks during taxi, take-off and landing, which relieves the landing gears and leads subsequently to less abrasion, and therefore reduced maintenance costs for airlines. The asphalt pavements have to absorb high thrust and brake forces which could lead to deformation of the asphalt pavement if it is not designed to withstand these forces.

2) How does the material you have developed help with the loads/forces involved? The crystalline network Sasobit builds in the bitumen leads to an increased resistance against permanent deformation. Tests of the application of the combination of polymers (SBS) plus Sasobit display very good results. The improved compaction leads to a better performance of the asphalt mix which is a combination of deformation resistance, cold temperature behavior and fatigue.

3) A lot of runway maintenance work is done at night. How is the material you have developed designed to fit with night time operations? Sasobit modified asphalt mixes are perfect for night time operations as it combines the two effects of the additive. The mixing and paving temperatures can significantly be reduced by up to 30°C. This means, the asphalt can be placed at lower temperatures. At the same time, due to the crystalline network, the runways can be opened to traffic at relatively high surface temperatures.

During paving operations at Fraport in 2005 for example, the surface temperature was still 80°C when the runway was opened to air traffic.

4) How important are environmental factors in runway maintenance and how do your materials address these issues? Sasobit helps to lower CO2 emissions and also protects workers from fumes and aerosols simply because the material can be produced and paved at lower temperatures.

You save energy and CO2 at the mixing plant, because your material requires minimal heating.

In consequence, the better performance of the asphalt pavement with Sasobit leads to longer service time which makes maintenance less often necessary. This also has a positive impact on the environment but also saves money.

Asphalt pavements including Sasobit show a significant resistance to fuels and de-icing agents and so the risk of these liquids seeping into the groundwater is minimized.

Once the asphalt pavement has reached the end of its lifetime, it can be recycled up to 100 per cent. This is a big advantage of the material 'asphalt' itself, independent from the additives which are being used.

5) Finally, airport operators need to ensure that disruption to the airport is kept to the absolute minimum. How does your material help with that process? The modification of bitumen with Sasobit allows lower mixing and paving temperatures. This equates to faster setting times, significantly minimizing closures of airport runways and taxiways.These are some of our references where Sasobit has successfully been used for airport renovations.

These are 'old' reference but since using FT waxes in asphalt mixes has become a recognized technology, we cannot follow all projects individually.

Project	Year completed	Size (m²)	Pavement design	Reason for using SASOBIT®
Runway and Taxiway of Gelendzhik Airport, Russia	2007	200 000	AC 0/8 S, AC 0/16 S Pen 60/90 plus 3% Sasobit	• High compaction and low void content • Improved deformation resistance required
Runway and Taxiway of Svalbard Airport, Norway	2006	170 000	AC 0/11 Bitumen Pen 430 plus 3% Sasobit	• High compaction and low void content at low ambient temperatures • Improved deformation resistance required as soft base bitumen was used
Runway of Belgrad Airport, Serbia	2005	20 000	AC 0/8, AC 0/16 PmB 60/90 plus 3% Sasobit	• Improved deformation resistance required • Earlier opening to traffic
Runway of Linz-Hörsching Airport, Austria	2005	50 000	AC 0/16, BT 0/22 PmB 60/90 and Bitumen Pen 70/100 plus 3% Sasobit each	• Improved deformation resistance required • Earlier opening to traffic
Apron and Taxiway of Johannesburg Airport, South Africa	2005	80 000	SMA 0/11 S Bitumen Per 60/70 plus 4% Sasobit	• High compaction at low ambient temperatures • Improved deformation resistance required
Runway of Frankfurt Airport, Germany	2005	250 000	Full depth reconstruction SMA 0/11 S AC 0/22 S, AC 0/32 CS PmB 45, PmB 25 and Bitumen Pen 30/45 plus 4% Sasobit each	• Replacement of concrete on tight time schedule • High compaction at low ambient and reduced mix temperatures • Limited period for curing