

SASOL
reaching new frontiers



Morro Bay, CA – Warm Mix Open House

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Sasol Wax
Wax is all we do. So we do it best.



SASOBIT

- Introduction
- What is Sasobit?
- Questions



What is Sasobit?

- Fine crystalline long chain aliphatic hydrocarbon.
- Also known as WAX
 - *Not the wax that is naturally found in liquid asphalt*
 - *It has a melting point range of between 185 - 239 deg. F and is completely soluble in asphalt at temperatures above 239 deg. F*
- It is manufactured from natural gas using the Fisher Tropsch process of polymerization
 - *At one time we did manufacture it from coal but in 2003 Sasol invested in a \$354 million pipe line to pipe the gas from Mozambique to Sasolburg.*
 - *We have been importing this wax into the States for 53 years. Sasol continues to do a feasibility study to possibly start a grass roots Fisher -Tropsch plant here in the USA. This plant would most likely use coal as its feed stock and be primarily run for fuels.*



What does Sasobit look like?

- *Sasobit is available in a solid form.*
 - *A prill (about 5mm in diameter)*
 - *Or a small prill (1mm in diameter)*
 - *Flaked form (3mm chips)*

- *It is packaged in 20 kg bags and 600 kg super sacks*



Prilled Sasobit





Small Prilled Sasobit





Flaked Sasobit





Is Sasobit safe to have around a plant or lab?

- Sasobit is very safe to both humans and animals.
 - *It actually carries a food grade designation of FDA175.105*
 - *Indirect food contact – hot melt adhesives for boxes*



Is Sasobit susceptible to damage by water or humidity?

- Sasobit can get wet, water does not harm the effectiveness of the wax. We do recommend waiting for the wax to air dry before putting it into hot asphalt
- There are no special conditions that Sasobit needs to be stored



What does Sasobit do to make a HMA a Warm Mix Asphalt?

- Sasobit lowers the viscosity of the binder and also acts as a flow modifier in the mix.
- While in its liquid state, this modification allows the aggregate to move more freely in the binder.
- When Sasobit cools and crystallizes it forms a uniform network structure in the binder.



How is Sasobit used in a WMA?

- It is unique from most of the other warm mix additives in that it can be added to both the binder and the mix
- When adding it to the mix you blow it into the asphalt stream before the asphalt hits the aggregate
- Sasobit injection machine from Hi-Tech Asphalt Solutions





Sasobit shown going into the drum

- Here the Sasobit is being added directly to the drum.





When adding Sasobit to the binder...

- It can be mixed into the binder with a normal paddle mixer – high shear mixing is NOT needed.
- Once they are blended together the Sasobit stays homogeneous and can be kept in storage for up to several weeks or more.



How much Sasobit do you need?

- The recommended dosage is 1.3% - 1.7% Sasobit by weight of the binder; we target 1.5%. If the binder content of the mix is 5% then 1.5 pounds of Sasobit would treat a ton of mix.
- When adding RAP the percent of binder in the RAP would need to be calculated in the formula
- This equates to 30 pounds per ton of binder without RAP and 37.6 pounds per ton of binder with 20% RAP in the mix; figuring 5% binder in the RAP



What temperature can you run the plant?

- That depends...Initially we target 50 degrees F below the plant temperature for the normal control mix.
- Once the plant operator is comfortable with this temperature drop we will make a second drop of an additional 10 – 25 degrees F, again depending on the mix.
- Note: No one knows the plant better than your plant operator. We are not going to ask the operator to run the plant under conditions that he doesn't feel comfortable with.



Are there any issues with the lower WMA temperatures and the bag house?

- We target the bag house temperature to be no less than 200 degrees F. Depending on air flow and water %.
- It is our opinion that temperatures lower than this might cause problems in the bag house like clogging and water vapor build up.
- This safe guard keeps the minimum plant operating temperature at around 230 – 240 degrees F.



What effect does Sasobit have on the PG grading of the binder?

- The addition of Sasobit at 1.5% to 2.0% increases the upper end by 4 – 6 degrees.
- It could also increase the low end of the PG grading from 0 to about 3.0 degrees. This is offset by the lack of oxidation of the lower production temperatures.



How does this effect the cold weather cracking?

- It has been our experience that because there is less oxidation of the asphalt because the temperatures are lower in WMA there is no change in the low temperature cracking.
- There was a study done by the University of Florida in July 2006 that showed that using Sasobit at a rate of 1.5% did not have a negative effect on fracture performance



Can you use Sasobit with RAP and what are the benefits?

- The unique viscosity reducing features of Sasobit along with the internal lubricating effects allows for easier handling of RAP mixes.
- RAP usage can be increased to 35% to 45% or even higher.
- Even with high percentages of RAP you can still achieve density at lower paving temperatures.



How much asphalt has been treated with Sasobit so far?

- Over the past 11 years around the world more than 10 million tons of mix has been blended with Sasobit. It has been used to pave everything from airport runways and taxiways to container ports, race tracks, roads, parking lots and drive ways.
- In North America in the last 2 years, we have sold enough Sasobit to blend more than 250,000 tons of warm mix.



Some of the more demanding paving jobs

- Airports
 - *Frankfurt Airport - Frankfurt, Germany*
 - *Svalbard Airport– Most northern commercial airport in the world*
 - *Logan Airport, Boston, MA*
- Container Ports
 - *Heavy duty paving in some of the worlds busiest ports*
- Race Tracks
 - *Sasobit has been trusted for use on NASCAR tracks – Talladega, Homestead and Watkins Glen*
- Extra long hauls
 - *750 kilometers (466 miles) in Australia*



Some of the projects done over the past year

- Ottawa, CN
- HVS test track by Caltrans and Graniterock in California
- Yellowstone National Park, WY
- Dillon, CO
- Chicago, IL
- Mt. Holey, NJ
- Open house at Tilcon in NJ
- Logan Airport in Boston, MA
- Verdel, NE
- Private work from coast to coast



Some states where projects are scheduled for 2008

- Massachusetts
- New York
- Texas
- California
- South Carolina
- New Jersey
- Georgia
- Washington
- Alaska
- Pennsylvania



Our largest Sasobit Warm Mix Project in USA

- Massachusetts – 45,000 tons of warm mix on I-93; one of the largest interstates going into Boston.
- Project is scheduled to begin May 16, 2008



Thank You.....Any Questions?

