BITUMEN
WHAT IS BITUMEN?

Bitumen is a black or dark-colored (solid, semi-solid, viscous), amorphous, cementitious material that can be found in different forms, such as rock asphalt, natural bitumen, tar, and bitumen derived from oil, which is referred to as petroleum bitumen. A mixture of hydrocarbons occurring as a residue from petroleum distillation. Soluble in carbon disulfide. Combustible.

Bitumen is a mixture of hydrocarbons and thermoplastic material having strong tarry odour. It stiffness is dependent on temperature. The temperature-vs-stiffness relationship of bitumen is dependent on the source of crude oil and the method of refining. It is also known as Asphalt and Mineral Pitch.
Bitumen is actually the liquid binder that holds asphalt together. The term bitumen is often mistakenly used to describe asphalt.

A bitumen-sealed road has a layer of bitumen sprayed and then covered with an aggregate. This is then repeated to give a two-coat seal. Asphalt is produced in a plant that heats, dries and mixes aggregate, bitumen and sand into a composite mix. It is then applied through a paving machine on site as a solid material at a nominated or required thickness, relative to the end use. Asphalt results in a smoother and more durable surface than a bitumen-sealed road.
Bitumen is applied in construction and maintenance of:

- Highways
- Airport runways
- Footways / Pedestrian Ways
- Car parks
- Racetracks
- Tennis courts
- Roofing
- Damp proofing
- Dams
- Reservoir and pool linings
- Soundproofing
- Pipe coatings
- Cable Coatings
- Paints
- Building Water Proofing
- Tile underlying waterproofing
- Newspaper Ink Production
- And many other applications
The crude oil is pumped from storage tanks, where it is kept at about 60°C, through a heat exchanger system where its temperature is increased to typically 200°C by exchanging heat gained from the cooling of newly produced products in the refining process. The crude is then further heated in a furnace to typically 300°C where it is partly vaporised into an Atmospheric Distillation Column. Here the physical separation of the components occurs. The lighter components rise to the top and the heaviest components (the atmospheric residue) fall to the bottom of the column and pass through a second heat exchanger prior to treatment in a vacuum distillation column. Finally, Bitumen is obtained by vacuum distillation or vacuum flashing of atmospheric residue from the vacuum distillation column. This is “straight run bitumen”. This process is called bitumen production by straight run vacuum distillation.
BITUMEN AND TARSANDS OCCURRENCE IN THE DAHOMEY BASIN

Legend
- Towns
- Bitumen locations (BPIC)
- Tarsands location (BPIC)
- Seeages
- National Bitumen Project, Akure Tarsands locations, Ondo State Projects (NBP)
- Geological Consultancy Unit Bitumen Boreholes (Ondo State Project), University of Ife
- Bitumen locations (BPIC)

Geology
- Alluvium
- Benin Formation (Pleistocene-Oligocene)
- Iaro Formation (Upper-Middle Eocene)
- Ewekoro Formation (Lower Eocene-Paleocene)
- Abeokuta Formation (Turonian-Cenomanian)
- Lokol Afrik Petroleum Ltd Bitumen Tile Block

Kilometers
# SPECIFICATION OF PENETRATION GRADE BITUMEN

<table>
<thead>
<tr>
<th>PROPERTY</th>
<th>RANGE</th>
<th>STANDARD</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>BITUMEN 80/100</td>
<td>BITUMEN 60/70</td>
</tr>
<tr>
<td>Specification Gravity @25/25 °C</td>
<td>1.01/1.06</td>
<td>1.00/1.05</td>
</tr>
<tr>
<td>Penetration @ 25 °C</td>
<td>80/100</td>
<td>60/70</td>
</tr>
<tr>
<td>Softening Point ° C</td>
<td>45/52</td>
<td>49/56</td>
</tr>
<tr>
<td>Ductility @ 25 ° C CMS</td>
<td>100 Min</td>
<td>100 Min</td>
</tr>
<tr>
<td>Loss on Heating (wt)%</td>
<td>0.5 Max</td>
<td>0.2 Max</td>
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<tr>
<td>Drop in Penetration After Heating %</td>
<td>20 Max</td>
<td>20 Max</td>
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<tr>
<td>Flash Point °C</td>
<td>225 Min</td>
<td>250 Min</td>
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<tr>
<td>Solubility in CS@ (wt)%</td>
<td>99.5 Max</td>
<td>99.5 Max</td>
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<tr>
<td>Spot Test</td>
<td>Negative</td>
<td>Negative</td>
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<tr>
<td>Density @25° C</td>
<td>1.01/1.06</td>
<td>1.00/1.05</td>
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</tbody>
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