



BUOYANCY[®]
IMPEX PVT. LTD.

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Polymer Modified Bitumen 82-10

Polymer modified bitumen (PMB) is one of the specially designed and engineered bitumen grades that are used in making pavement, roads for heavy duty traffic and home roofing solutions to withstand extreme weather conditions. PMB is a normal bitumen with the added polymer, which gives it extra strength, high cohesiveness and resistance to fatigue, stripping and deformations, making it a favorable material for infrastructure.

Pavements designed and constructed for heavy-duty traffic and extreme weather conditions require specially designed engineered Bitumen Grades. By changing the characteristics of normal bitumen with the addition of a polymer, either they are of elastomeric nature or elastomeric, we succeed to obtain bitumen that allows the mixture to be more cohesive, with much more strength and significant higher resistance to parameters like fatigue and permanent deformations for road pavements.

The polymer that is added is styrene butadiene styrene (SBS), which acts as a binder modification agent. The primary objective of SBS polymer modified bitumen is to provide extra life to pavement, roads and construction designs. With addition of either synthetic polymers or synthetic rubbers to various penetration or viscosity grades, results in a product, which allows the mixture to be more cohesive, having strength and significant higher resistance to parameters like fatigue and permanent deformations for road pavements. These bitumen binders are also found to be capable to seal cracks effectively, when applied over extensively cracked flexible or rigid pavement.

Polymer and Rubber modified binders are classified as per type of modifier as under:

Type	Modifiers	Examples
Synthetic Polymers	Plastomeric Thermoplastics	Polyethylene (PE), Ethylene Vinyl Acetate (EVA), Ethylene Butyl Acrylate (EBA) and Ethylene Ter Polymer (ETP), etc.
	Elastomeric Thermoplastics	Styrene Isoprene Styrene (SIS), Styrene-Butadiene Styrene (SBS) Block Copolymer, etc.
Synthetic Rubbers	Synthetic Rubber Latex	Styrene-Butadiene Rubber (SBR) latex and any other Suitable synthetic Rubber
Other Rubbers	Natural Rubber	Latex or Rubber Powder
	Crumb Rubber	Crumb Rubber Modifier

BUOYANCY[®] exports Polymer modified Bitumen as per EN 14023-2012, ASTM D5976-00, AASHTO M 320 and PG Grading System like PG 80-10, PG 74-10, PG 70-26, PG 70-28, etc. or SUPERPAVE[™]

Accredited: ISO9001:2015 | ISO 14001:2015 | ISO45001:2018

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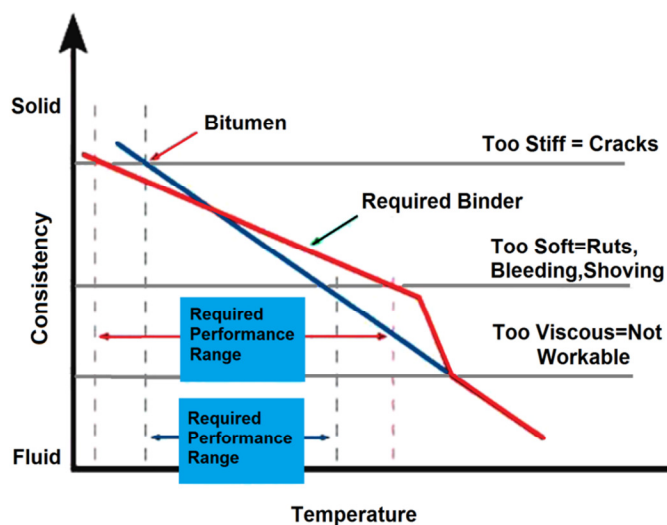
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Test Parameter	Results
Flash Point Temperature (°C), T48	230 Min
Viscosity, ASTM D4402: Maximum, 3 Pas Test Temperature (°C)	135
Dynamic Shear, TP5; $G^*/\sin \delta$, Minimum, 1.00 kPa ,Test Temperature (°C) at 10 rad/s	82
ROLLING THIN FILM OVEN (T240) OR THIN FILM OVEN (T179) RESIDUE	
Mass loss, Maximum	1%
Dynamic Shear, TP5; $G^*/\sin \delta$, Minimum, 2.20 kPa ,Test Temperature (°C) at 10 rad/s	82
PRESSURE AGING VESSEL RESIDUE	
P.A.V. Aging Temperature (°C)	110
Dynamic Shear, TP5; $G^*/\sin \delta$, Minimum, 5000 kPa ,Test Temperature (°C) at 10 rad/s	40
PHYSICAL HARDENING REPORT	
Creep Stiffness, TP1 Stiffness, Maximum, 300.0 MPa at 60 seconds m-value, Minimum, 0.300 at 60 seconds Test Temperature (°C)	0
Direct Tension, TP3 Failure Strain, Minimum, 1.0% (loading rate of 1.0 mm/min) Test Temperature (°C)	0

When a polymer is added to regular bitumen, it becomes more elastomeric, which provides it with additional elasticity. The polymer that is added is styrene butadiene styrene (SBS), which acts as a binder modification agent. The primary objective of SBS polymer modified bitumen is to provide extra life to pavement, roads and construction designs. Some of the qualities exhibited by PMB are

- 1) Higher rigidity
- 2) Increased resistance to deformation
- 3) Increased resistance to cracks and stripping
- 4) Better water resistance properties
- 5) High durability



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Advantage of using polymer modified bitumen

- 1) Stronger road with increased marshall stability value and greater Rigidity.
- 2) Better resistant towards rainwater and water stagnation.
- 3) No stripping and no potholes.
- 4) Better resistance to permanent deformation
- 5) Reduction in pores in aggregate and hence less rutting and raveling.
- 6) Much higher durability

Use as needed

While the benefits of using modified asphalts are widely acknowledged, not all asphalt mixes or treatments need to be modified. Each application should be evaluated to determine if the traffic loading, anticipated service life, environmental conditions and desired performance justify the use of modifiers. Modified asphalts can be a good investment.

In addition to the primary aims above, the range of properties improved include

- 1) Durability
- 2) Aggregate retention
- 3) Resistance to permanent deformation
- 4) Resistance to fatigue cracking
- 5) Cohesion (internal strength)
- 6) Elasticity
- 7) Viscosity less susceptible to temperature changes
- 8) Modification agents

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