BUOYANCY®
IMPEX PVT. LTD.

"C" Tower, 10th Floor, Hampton Park,
Vesu, Surat 395007 Gujarat, India
+91 99250 53193
+91 99250 53069
info@buoyancyimpex.com
buoyancyinc@gmail.com

Performance Grade Bitumen – 58/22

Performance Grade Bitumen is graded based on pavement temperatures. In Super-pave grading system, binders are classified according to their Performance in extreme hot and cold temperatures and called as Performance Grade Bitumen. The main purpose of grading and selecting asphalt binder using the Performance Grade system is to make certain that the binder has the appropriate properties for environmental conditions in the field. Performance Grade asphalt binders are selected to meet expected climatic conditions as well as traffic speed and volume adjustments. Therefore, the Performance Grade system uses a common set of tests to measure physical properties of the binder that can be directly related to field performance of the pavement at its service temperatures by engineering principles. Performance grade bitumen generally are mostly applied in paving constructions and reconstructions, sealing of edges, crack sealing, spray applications for the bridge deck, and in both dense-graded and open-graded Hot Mix Asphalt (HMA). PG grades that are well-structured against thermal cracking are PG 58-34, PG 64-22, PG 64-28, and PG 76-22. PG grades that are resistant to rutting are PG 70-22, PG 70-28, PG 76-28, and PG 82-22.PG 58-28 is specifically used in very cold regions.

Property	Results	Test Method
Average 7-day maximum pavement Design Temperature, °C	58	
minimum pavement Design Temperature, °C	> -22	
Original Binder		
Flash Point Temperature Minimum °C	230	AASHTO T48
Viscosity maximum 3 Pa.s, Test Temperature,°C	135	AASHTO T316
Dynamic Shear G*/sin minimum 2.2 KPa Test Temperature,°C	58	AASHTO T315
Rolling Thin Film Oven Test		
Mass change maximum percent	1.00	AASHTO T240
Dynamic Shear G*/sin minimum 2.2 KPa Test Temperature, @ 10 rad/s °C	58	AASHTO T315
Pressure Aging Vessel		
PAV aging Temperature, °C	100	AASHTO R28
Dynamic Shear G*/sin maximum 5000 KPa Test Temperature, @ 10 rad/s °C	22	AASHTO T315
Creep Stuffiness S maximum 300 Mpa m-value minimum 0.300 Test Temp,@ 60s°C	-12	AASHTO T313
Direct Tension Failure strain minimum 1 % Test Temp@ 1mm/min, °C	-12	AASHTO T314
Critical low cracking Temperature Critical cracking determined by PP42 Test Temp	-12	AASHTO PP42

BUOYANCY®
IMPEX PVT. LTD.

"C" Tower, 10th Floor, Hampton Park,
Vesu, Surat 395007 Gujarat, India
+91 99250 53193
+91 99250 53069
info@buoyancyimpex.com
buoyancyinc@gmail.com

Advantages

1) Empirical methods such as viscosity and penetration grading systems were developed based on old experiences and can be applicable if those conditions still exist. But, climatic and current traffic conditions are rapidly changing and past experiences can no longer be defining criteria. In the PG system, it is possible to use actual traffic volume and vehicle speed which represents the duration of loads are applied.
2) Common tests are conducted at a single test temperature which is 25°C in penetration and 60°C in viscosity test, which means that they cannot give any details about how the bitumen would behave in low or high temperatures. Superpave grading indicates a working temperature range of binder and therefore, helps with choosing the best type according to the condition each project demands.
3) Because of the visco-elastic properties of bitumen, the rate of load application and temperature have a great effect on its behavior.
4) Although the behavior of bitumen in lower loading rates corresponds to that of higher temperatures, none of the other grading systems doesn't take the rate of load into account except for Superpave.
5) While Superpave can be easily used for both unmodified and modified bitumen, conventional methods are used only for unmodified bitumen types,
6) Conventional methods ignore the long-term aging of binders and its behavior. But Superpave takes both long-term aging -using with the pressure aging vessel (PAV)- and short-term aging -using the rolling thin film oven test (RTFOT)- into account.
7) Bitumen properties indicated at different temperatures contribute to resistance to the distresses in a different level. Bitumen contributing in a better rutting resistance is measured at maximum pavement temperatures and which leads to a more elastic and stiffer binder. Bitumen contributing to fatigue resistance is the most crucial at average pavement temperatures and it requires a softer bitumen while it still favors an elastic binder. Bitumen contribution to thermal cracking is sensitive at minimum pavement temperatures and it demands a less elastic and soft bitumen.