

**TOSAN  
PETRO**



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# **C**ONTENTS

About  
why choose us

Quality Control services  
About  
services:

Drum Making  
Drum Filling  
Packing  
Transporting and Shipping

classified grade types bitumen:


Drum Making  
Drum Filling  
Packing  
Transporting and Shipping

Penetration Value of Bitumen  
Bitumen Penetration Grade  
Bitumen Viscosity Grade

Performance Grade (PG) Bitumen:  
General Description of Performance Grade (PG) Bitumen  
Performance Grade (PG) Bitumen Nomenclature  
Performance Grading Should:  
Methods of Selection  
Application of Performance Grade (PG) Bitumen



# [ABOUT US]

A black and white photograph of an industrial facility, likely a bitumen production plant. In the upper portion, two tall, cylindrical chimneys or smokestacks rise against a cloudy sky, with metal walkways and ladders spiraling around them. The lower portion of the image shows a complex network of pipes, valves, and large cylindrical tanks, with a metal walkway in the foreground. The overall scene is industrial and technical.

**Tosan Petro** is a leading group company in bitumen industry. We apply all standards by using new bitumen production technologies at the top of our priorities for our all grades of bitumen.

**Tosan Petro** brand is well known in many abroad markets especially in neighborhood countries such as: India, Emirate, Singapore, Indonesia, Malaysia, Taiwan, Pakistan, Afghanistan, Turkmenistan, Uzbekistan, Armenia, Georgia, China, Myanmar and Africa markets.

As we have constructed our business on solid grounds of high-quality products, competitive pricing, on time delivery and efficient logistic services, Tosan Petro has become known as a reliable supplier in international bitumen market and the number of our customers is increasing at a startling pace. Benefiting from a skillful staff and extensive expertise in commercial, financial and logistic affairs, we provide our customers with a professional experience. We supply different types of Bitumen including Penetration Grades, Viscosity Grades, Performance Grades and Cut Back Grades in a variety of packages including bulk, different size of drums, poly bags, Flexi bags and carton. We provide our customers with top quality bitumen.

Our main goal is to attend significantly in the global market to respond customers' requirements and meet their inquiries by using updated knowledge, high quality products, the best price, the best customer services by employing high educated, experienced and professional employees at our team.

Tosan Petro is committed to contribute its role to a sustainable development for all countries around the world by delivering bitumen in a clean and trusted way.

## **MISSION AND OBJECTIVES**

As an international trading firm, we use our expertise and logistical networks to meet our customers' expectation efficiently and responsibly while offering them value added services.

### **Values**

- Honesty
- Integrity
- Respect
- Openness
- Teamwork Strive for excellence Adapting to changing customers' expectations
- Being Responsible to our customers, our employee and those with whom we do business.
- Sustainable Development

We bring you our knowledge and experience to build a strong understanding of update realities and new perspectives on the future of bitumen, oil and petroleum industries.

we are ready to supply high quality consultancy, marketing and export services in bitumen industry for your company.



# CORE VALUES





## Services

Tosan Petro delivers Bitumen products in different packing types mentioned herein as per customer's request.

### **Drum:**

Steel drums are considered as the main packing method for bitumen. SEBCO is one of the leading packing companies in the Middle East. Benefiting from two drumming plants with the total annual capacity of 300,000 MT, skillful staff and extensive expertise in Bitumen packing alongside using high quality steel sheets produced by well-known steel manufacturers, ensures the superb quality of Tosan Petro drums. In order to meet our customers' requirement, Tosan Petro drumming facilities have been designed to be capable of producing standard and custom-made packages.

- We provide our customers with new steel drums in different sizes of 150 Kg,180Kg,200 Kg ,240 Kg and any other size as per customer's request.
- We can produce drums with customer's embossed logo on top of drums or print any requested marking on drums body.
- The drums can be palletized.

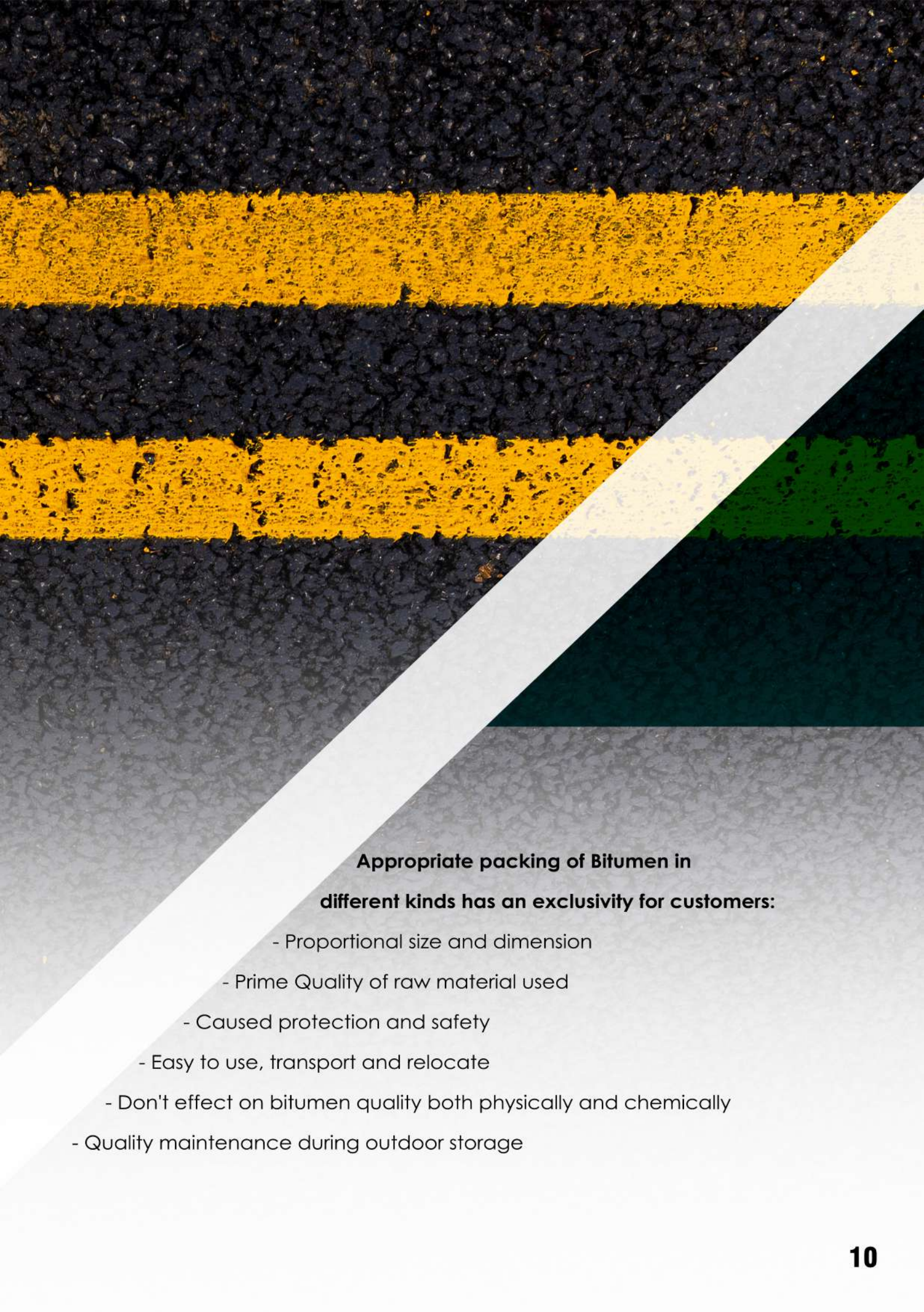
are considered as the most efficient and environmentally friendly solution to bitumen packing requirement. Tosan Petro supplies Bitubags in two sizes of 300 Kg and 1,000 Kg





# ▼ Packing

Bitumen is used as a binder in road construction and in protective coatings and adhesives used in the construction industry. In the most common processes, the bitumen is heated to 100-200°C until fluid enough to mix with aggregate. The 'hot mixed' materials must themselves be stored, transported and used hot to maintain their workability



**Appropriate packing of Bitumen in  
different kinds has an exclusivity for customers:**

- Proportional size and dimension
- Prime Quality of raw material used
- Caused protection and safety
- Easy to use, transport and relocate
- Don't effect on bitumen quality both physically and chemically
- Quality maintenance during outdoor storage

## Some type of packaging for bitumen:

### 1 The new steel drums, in different sizes:

## DRUMS

#### **190 ± 2.5 kg Gross Weight | 180 ± 2.5 kg Net Weight**

Height of drum	:	190 ± 2.5 cm
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Dia of drum	:	50.5 ± 0.5 cm
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Dia of cap lid	:	10.5 ± 0.5 cm
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#### **157 ± 3 kg Gross Weight | 148 ± 3 kg Net Weight**

Height of drum	:	82.5 ± 0.5 cm
----------------	---	---------------

Dia of drum	:	50.5 ± 0.5 cm
-------------	---	---------------

Dia of cap lid	:	10.5 ± 0.5 cm
----------------	---	---------------

#### **235 ± 2.5 kg Gross Weight | 225 ± 2.5 kg Net Weight**

Height of drum	:	98.5 ± 0.5 cm
----------------	---	---------------

Dia of drum	:	55 ± 0.5 cm
-------------	---	-------------

Dia of cap lid	:	10.5 ± 0.5 cm
----------------	---	---------------



**And all kinds of drums can be palletized according to the need for transportation and also for the customer's desire.**

## 2 Bitumen Jumbo Bag:

Large bags with high flexibility are made of polypropylene fiber fabrics and the layer inside is made of nylon. It has a high heat tolerance and melts at 160 degrees Celsius. The Jumbo Bag in the sizes of 300Kg and 1000Kg-1 MT is the other option of Jey Kim bitumen packing upon customers' demand and this packaging also can be palletized by shipping requirement. **We can handle the Jumbo bag with pallet and structure.**

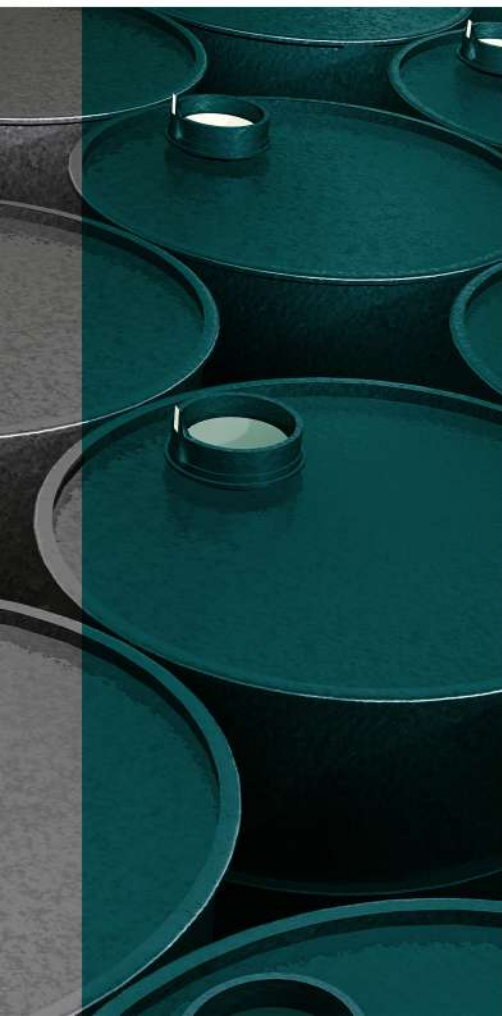
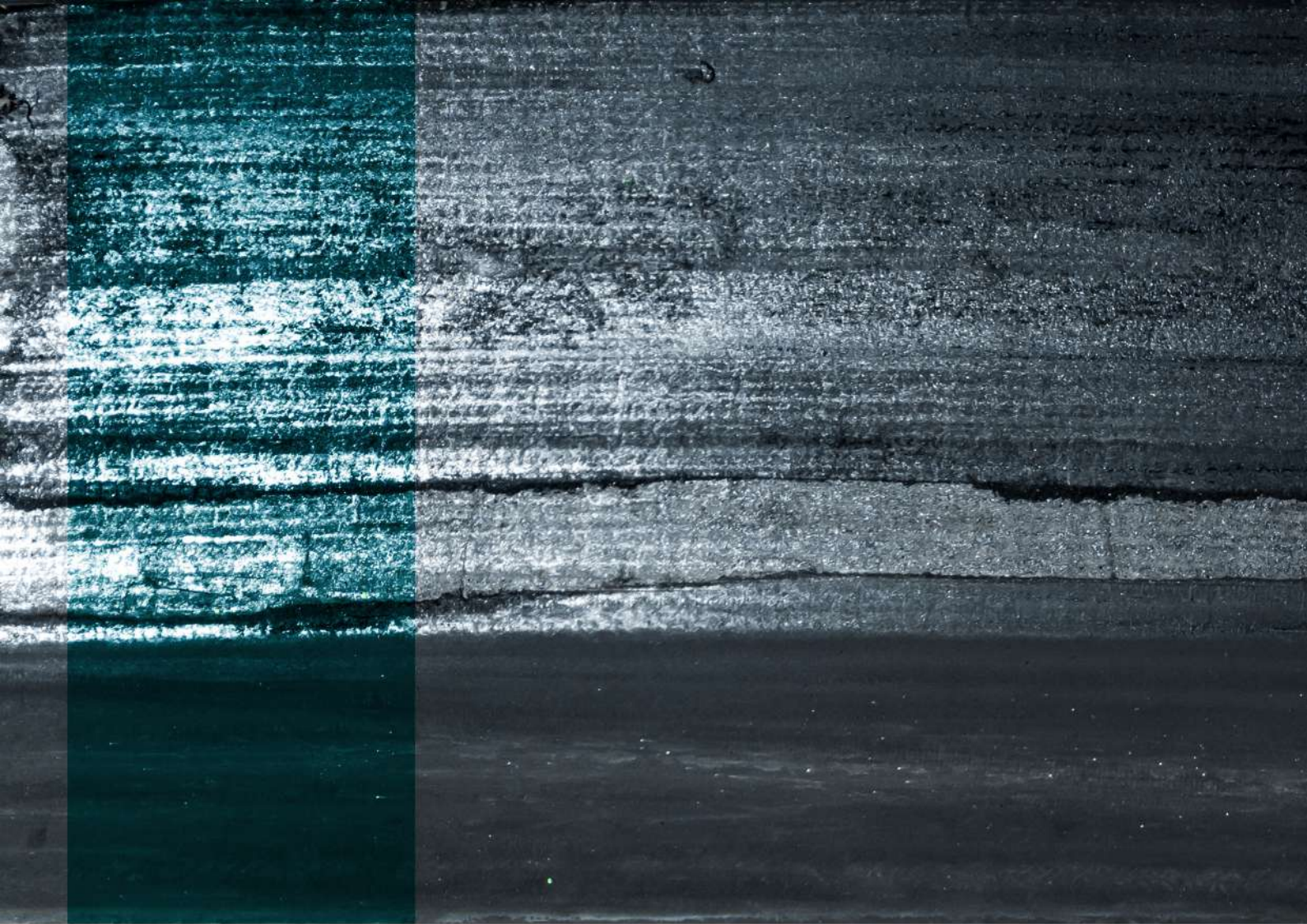


# JUMBO

1000\*1000\*1000 cm

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300\*300\*300 cm



# TANK

	<b>Flexitank</b>	<b>Bulk containers</b>
Number of units	1	1
each unit	24000 kg	25000-28000 kg
Total capacity	24000 kg	25000-28000 kg



## **Bulk TRUCK:**

Bulk bitumen cargoes

can be supplied in tankers ranging in size between 1,000 and 8,000 metric tons; while most deliveries by tanker will be direct into a tank terminal or it will be delivered directly in Bandar Abbas terminals which can be offered in this ports with a very high volume from 5000 MT to 25000 MT (in several parts).

**FLEXI TANK:** we can send the tanks on ports or ship by flexi tank to the destination parts as well.







## **BULK SHIP :**

The products also can be delivered in bulk directly to client storage; Bulk Vessels for bitumen vary in size and capacity. Tosan petro Bitumen Company supplies all grades of Bitumen in Bulk based on all type of terms depending on the customer's inquiry. The most effective factors of Bulk Bitumen Carrier Rates are Service Charges, Port of Discharge, Season of Loading, Discharge Terminal Fees, Bunker Price in Destination and Vessel Capacity.



**RAIL** the transportation of bitumen by rail is one proposed solution to access for some special market in some countries

**ALL packing services can be presented to customers in the shorter time and competitive cost.**



**SAFETY FIRST**

# About containers:

[ 20 foot container ] each container holds of 110 drums in each container.  
Each container can hold of 20 Jumbo Bags  
( with pallet and Iron structure )



[ 40 foot container ]

Each container holds of 115 drums at the bottom and 28 drums at the top.

Each container holds of 22 Jumbo Bags at the bottom and 8 Jumbo Bags at the top(with pallet and structure)

# Transporting and Shipping





## Transporting and Shipping

Transporting and Shipping: Tosan petro bitumen Co. has excellent local transporting and shipping services to make facility for customers to dispatch their cargo to the different destinations. By more than 20 years working with transporting and shipping companies, we are placed in superior position to use more convenient transporting and shipping network to enable our customers to receive lowest handling charge and the best services. Our Bitumen is transported in drums-jumbo bag and also bulk in various dimensions and weight. Tosan petro Bitumen fulfills the Incoterm 2020 totally. It's make can help the reduction of the prosecutions and ambiguity among the buyers and sellers.



**The bitumen can be classified into the following grade types**

- **Bitumen Penetration Grade**
- **Bitumen Viscosity Grade**
- **Bitumen Performance Grade**
- **Oxidized Bitumen Grades**
- **Cut Back Bitumen**
- **Bitumen Emulsion**
- **Polymer Modified Bitum**





## Bitumen penetration grades:

The penetration grade bitumen is refinery bitumen that is manufactured at different viscosities. The penetration test is carried out to characterize the bitumen, based on the hardness. Thus, it has the name penetration bitumen. Bitumen penetration grades are ideal for paving roads and other surfaces. They are named after their method of grading. For classifying bitumen after production, we use a device named penetrometer. The device has a standard needle that penetrates the sample of bitumen and helps us measure the hardness level of bitumen. If the needle goes easily into the bitumen sample in a given time, the bitumen is softer, but if it struggles to enter the sample, it is harder. The softest grade of bitumen penetration is called 100/120, and the hardest grade of bitumen penetration is called 30/40. Other grades of bitumen penetration are 10/20, 20/30, 40/50, 60/70, 80/100, and 85/100, 120/150, 200/300.

The penetration bituminous asphalt with high penetration numbers which are soft, mostly used in cold weather conditions and hard bituminous asphalt (low penetration number) can be used for warm weather condition.

It is a kind of hard penetration grade bitumen which is provided during the process of oxidation of vacuum bottom the bitumen production that drives from distillation tower residue in vacuum oil refineries at bitumen production unit. Bitumen penetration grade 10/20 ensures long-term savings because it allows for a thinner pavement design, which uses up to 30% less asphalt than traditional designs while ensuring extended pavement life.

## Bitumen penetration Grade 10 /20

Bitumen penetration grade 10/20 means the penetration value is in the range 10 to 20 at standard test, it is hard penetration grade bitumen .This grade of bitumen is mainly used in the manufacture of hot mix asphalt for bases and .wearing courses This Penetration Grade of Bitumen is a standard bitumen usually used as a Paving Grade Bitumen essential for road construction and for the production of asphalt pavements with superior properties, and it's very important once it bounds the aggregates and creates a unique cohesion and stability to the bituminous mix

No.	Analysis	Unit	Limit	Test Method
1	Density@25° C	Kg/m <sup>3</sup>	1010-1060	ASTM D70 or D3289
2	Penetration@25° C	Mm/10	10-20	ASTM D5
3	Softening point	°C	120	ASTM D36
4	Ductility@25° C	Cm	3 Min.	ASTM D113
5	Loss on heating	Wt%	0.2 Max	ASTM D6
6	Drop in penetration after heating	%	20 Max	ASTM D5 and D6
7	Flash point	°C	225 Min	ASTM D92
8	Solubility in Trichloroethylene	Wt%	99.0 Min	ASTM D4
9	Spot test	-	Negative	AASHTO T102
10	Viscosity@60vC			
11	Viscosity@135 C			
12	Wax conect			

## Bitumen penetration Grade 20/30

Bitumen penetration grade 2030/ means the penetration value is in the range 20 to 30 at standard test, Penetration grade bitumen have a thermoplastic property which causes the material to soften at high temperatures and to harden at low temperatures. Bitumen penetration grade 2030/ is hard penetration grade bitumen used as a paving grade bitumen which is suitable for road construction and repair with superior properties. It is also used for the production of asphalt pavements with technical specifications. This grade of Bitumen is mainly used in the manufacture of hot mix asphalt for bases and wearing courses.

No.	Analysis	Unit	Limit	Test Method
1	Density@25° C	Kg/m <sup>3</sup>	1010-1060	ASTM D70 or D3289
2	Penetration@25° C	Mm/10	20-30	ASTM D5
3	Softening point	°C	80-90	ASTM D36
4	Ductility@25° C	Cm	3 Min.	ASTM D113
5	Loss on heating	Wt%	0.2 Max.	ASTM D6
6	Drop in penetration after heating	%	20 Max.	ASTM D5 and D6
7	Flash point	°C	225 Min	ASTM D92
8	Solubility in Trichloroethylene	Wt%	99.0 Min	ASTM D4
9	Spot test	-	Negative	AASHTO T102
10	Viscosity@60v C	P		
11	Viscosity@135 C	CST		
12	Wax conent	%		

## Bitumen penetration Grade 30/40

It is a kind of bitumen and standard penetration grade. This type is petroleum grade bitumen, manufactured from fractional- vacuum destination of crude oil. Bitumen penetration grade 3040/ means the penetration value is in the range 30 to 40 at standard test Bitumen penetration grade 3040/ is semi-hard penetration grade bitumen used as a paving grade bitumen which is suitable for road construction and repair. This grade of bitumen is mainly used in the manufacturing of hot mix asphalt for bases and wearing courses. Bitumen penetration grade 3040/ is one of the most used bitumen grades and it's a basic material for all other bituminous products.

No.	Analysis	Unit	Limit	Test Method
1	Density@25°C	Kg/m <sup>3</sup>	1010-1060	ASTM D70 or D3289
2	Penetration@25°C	Mm/10	30-40	ASTM D5
3	Softening point	°C	55-63	ASTM D36
4	Ductility@25°C	Cm	100 Min.	ASTM D113
5	Loss on heating	Wt%	0.2 Max.	ASTM D6
6	Drop in penetration after heating	%	20 Max.	ASTM D5 and D6
7	Flash point	°C	232 Min	ASTM D92
8	Solubility in Trichloroethylene	Wt%	99.0 Min	ASTM D2042
9	Spot test	-	Negative	AASHTO T102
10	Viscosity@60vC			
11	Viscosity@135 C			

## Bitumen Penetration Grade 40/ 50

Bitumen penetration grade 4050/ means the penetration value is in the range 40 to 50 at standard test, Bitumen 4050/ is a standard penetration grade bitumen usually used as a paving grade bitumen suitable to be used in producing hot mix asphalt for road construction and repair. It is also used for the production of asphalt pavements .This grade of bitumen is mainly used in the manufacturing of hot mix asphalt for bases and wearing courses. Bitumen 4050/ is one of the most used bitumen grades.

No.	Analysis	Unit	Limit	Test Method
1	Density@25° C	Kg/m <sup>3</sup>	1010-1060	ASTM D70 or D3289
2	Penetration@25° C	Mm/10	40-50	ASTM D5
3	Softening point	°C	49 Min	ASTM D36
4	Ductility@25° C	Cm	100 Min.	ASTM D113
5	Loss on heating	Wt%	0.2 Max.	ASTM D6
6	Drop in penetration after heating	%	20 Max.	ASTM D5
7	Flash point	°C	232 Min	ASTM D92
8	Solubility in Trichloroethylene	Wt%	99.0 Min	ASTM D2042
9	Spot test	-	Negative	AASHTO T102
10	Viscosity@60vC	P	4000±800	ASTM D2171
11	Viscosity@135 C	CST	400 Min	ASTM D2170
12	Wax conect	%	2 Max	DIN EN 12606-1

## Bitumen penetration Grade 60/ 70

Bitumen penetration grade 6070/ means the penetration value is in the range 60 to 70 at standard test, it is a standard penetration grade Bitumen which commonly used as a Paving Grade. Its penetration grade -the measure of bitumen hardness- is between 60 to 70. Bitumen penetration grade 60/ 70 is semi-hard penetration grade bitumen used as a paving grade bitumen which is suitable for road construction and repair. It is also used for the production of asphalt pavements with the special technical specification. This grade of bitumen is mainly used in the manufacturing of hot mix asphalt for bases and wearing courses. Bitumen 6070/ is one of the most used bitumen grades and it's a basic material for all other bituminous products. Penetration determines the hardness of bitumen 6070/ by measuring the depth to which a standard loaded the needle will vertically penetrate in 5 seconds, in a sample of bitumen maintained at a temperature of 25 degrees Celsius.

The most conventional grade of bitumen that performs well in the majority of road projects, is bitumen penetration 6070/. This grade of bitumen is the best option for coating and adhesion of aggregates in a wide range of temperatures (from -22 to +76). Although this grade of bitumen is less processed in comparison to other grades of bitumen, its quality is acceptable. To ensure that bitumen 6070/ will stand up to various temperatures, we do a number of tests on it, right after production. Among these tests are penetration, softening point, ductility, and flash point.

A bitumen penetration 6070/ is widely used across the world, it has hundreds of producers, and also the Middle Eastern countries. The region is currently a hub for bitumen 6070/ traders. The quality of bitumen pen 6070/ in this region is guaranteed with an acceptable amount of valuable hydrocarbons present in it. In addition, the price of this bitumen in the Middle East is much affordable than other countries too. ulsion, cutback bitumen and modified bitumen grades as well

No.	Analysis	Unit	Limit	Test Method
1	Density@25° C	Kg/m <sup>3</sup>	1010-1060	ASTM D70 or D3289
2	Penetration@25° C	Mm/10	20-30	ASTM D5
3	Softening point	°C	46 Min	ASTM D36
4	Ductility@25° C	Cm	100 Min.	ASTM D113
5	Loss on heating	Wt%	0.2 Max.	ASTM D6
6	Drop in penetration after heating	%	20 Max.	ASTM D5
7	Flash point	°C	232 Min	ASTM D92
8	Solubility in Trichloroethylene	Wt%	99.0 Min	ASTM D4
9	Spot test	-	Negative	AASHTO T102
10	Viscosity@60vC	P	2000±400	ASTM D2171
11	Viscosity@135 C	CST	300 Min	ASTM D2170
12	Wax conect	%	2 Max	DIN EN 12606-1



## Bitumen penetration Grade 85/ 100

Bitumen penetration grade 85/100/ means the penetration value is in the range 85 to 100 at standard test, Bitumen 85/100/ is a standard penetration grade bitumen usually used as a paving grade bitumen suitable to be used in producing hot mix asphalt for road construction and production of asphalt pavements for bases and wearing courses. Penetration Grade bitumen's are specified by the penetration and softening point test. Designation is by penetration range only. The penetration grade bitumen's have a thermoplastic property which causes the material to soften at high temperatures and to harden at lower temperatures. This unique temperature/viscosity relationship is important when determining the performance parameters such as the adhesion, rheology, durability and application temperatures of bitumen.

No.	Analysis	Unit	Limit	Test Method
1	Density@25°C	Kg/m <sup>3</sup>	1010-1050	ASTM D70 or D3289
2	Penetration@25°C	Mm/10	85-100	ASTM D5
3	Softening point	°C	42 Min	ASTM D36
4	Ductility@25°C	Cm	100 Min.	ASTM D113
5	Loss on heating	Wt%	0.5 Max.	ASTM D6
6	Drop in penetration after heating	%	20 Max.	ASTM D5 and D6
7	Flash point	°C	232 Min	ASTM D92
8	Solubility in Trichloroethylene	Wt%	99.0 Min	ASTM D2042
9	Spot test	-	Negative	AASHTO T102
10	Viscosity@60vC	P	1000±200	ASTM D2171
11	Viscosity@135 C	CST	250 Min	ASTM D2170
12	Wax conect	%	2 Max	DIN EN 12606-1

## Bitumen penetration Grade 100 /120

Bitumen penetration grade 100/120 means the penetration value is in the range 100 to 120 at standard test, Bitumen Penetration Grade 100/120- is Semi Hard penetration grade bitumen used as Paving Grade bitumen. It is suitable for road construction and repair. It is also used for the production of Asphalt Pavements. This grade of bitumen mainly used in the manufacturing of hot mix asphalt for bases and wearing courses. It's one of the most used bitumen grades and a basic material for all other bituminous products

No.	Analysis	Unit	Limit	Test Method
1	Density@25°C	Kg/m <sup>3</sup>	1010-1050	ASTM D70 or D3289
2	Penetration@25°C	Mm/10	100-120	ASTM D5
3	Softening point	°C	42-49	ASTM D36
4	Ductility@25°C	Cm	100 Min.	ASTM D113
5	Loss on heating	Wt%	0.2 Max.	ASTM D6
6	Drop in penetration after heating	%	30 Max.	ASTM D5 and D6
7	Flash point	°C	232 Min	ASTM D92
8	Solubility in Trichloroethylene	Wt%	99.0 Min	ASTM D2042
9	Spot test	-	Negative	AASHTO T102
10	Viscosity@60vC			
11	Viscosity@135 C			
12	Wax conect			

## Bitumen penetration Grade 120/150

Bitumen penetration grade 120/150/ means the penetration value is in the range 120 to 150 at standard test, this penetration Grade bitumen are specified by the penetration and softening point test. The designation is by penetration range only. This unique temperature/viscosity relationship is important when determining the performance parameters such as the adhesion, rheology, durability and application temperatures of bitumen. Bitumen Penetration Grade 120/150/ is a Bitumen usually used as a Paving Grade Bitumen suitable for road construction and for the production of asphalt pavements with superior properties and it's very important once it bounds the aggregates and creates a unique cohesion and stability to the bituminous mix. This grade of Bitumen is mainly used in the manufacture of hot mix asphalt for bases and wearing courses

No.	Analysis	Unit	Limit	Test Method
1	Density@25° C	Kg/m <sup>3</sup>	1010-1050	ASTM D70 or D3289
2	Penetration@25° C	Mm/10	120-150	ASTM D5
3	Softening point	°C	37 Min	ASTM D36
4	Ductility@25° C	Cm	100 Min.	ASTM D113
5	Loss on heating	Wt%	0.5 Max.	ASTM D6
6	Drop in penetration after heating	%	20 Max.	ASTM D5
7	Flash point	°C	218 Min	ASTM D92
8	Solubility in Trichloroethylene	Wt%	99.0 Min	ASTM D2042
9	Spot test	-	Negative	AASHTO T102
10	Viscosity@60vC	P	450±90	ASTM D2171
11	Viscosity@135 C	CST	170 Min	ASTM D2170
12	Wax conect	%	2 Max	DIN EN 12606-1

## Bitumen penetration Grade 150 /200

Bitumen penetration grade 150 /200 means the penetration value is in the range 150 to 200 at standard test, this penetration Grade bitumen are specified by the penetration and softening point test. The designation is by penetration range only. This unique temperature/viscosity relationship is important when determining the performance parameters such as the adhesion, rheology, durability and application temperatures of bitumen. The main common usage of Bitumen 150 /200 is being used as a binder of mineral aggregates in asphalt concrete and hot laid plant mix for highways, airports, parking areas, driveways and curbs. and stability to the bituminous mix. This grade of Bitumen is mainly used in the manufacture of hot mix asphalt for bases and wearing courses

No.	Analysis	Unit	Limit	Test Method
1	Density@25° C	Kg/m <sup>3</sup>	1010-1050	ASTM D70 or D3289
2	Penetration@25° C	Mm/10	150-200	ASTM D5
3	Softening point	°C	35 Min	ASTM D36
4	Ductility@25° C	Cm	100 Min.	ASTM D113
5	Loss on heating	Wt%	0.5 Max.	ASTM D6
6	Drop in penetration after heating	%	20 Max.	ASTM D5
7	Flash point	°C	218 Min	ASTM D92
8	Solubility in Trichloroethylene	Wt%	99.0 Min	ASTM D2042
9	Spot test	-	Negative	AASHTO T102
10	Viscosity@60vC	P	250±50	ASTM D2171
11	Viscosity@135 C	CST	150 Min	ASTM D2170
12	Wax conect	%	2 Max	DIN EN 12606-1



## Bitumen penetration Grade 200 /300

Bitumen penetration grade 200/ 300 means the penetration value is in the range 200 to 300 at standard test, Bitumen Penetration Grade 200 /300 is a standard penetration grade Bitumen usually used as a Paving Grade Bitumen suitable for road construction and for the production of asphalt pavements with superior properties. This grade of Bitumen is mainly used in the manufacture of hot mix asphalt for bases and wearing courses.

No.	Analysis	Unit	Limit	Test Method
1	Density@25° C	Kg/m <sup>3</sup>	990-1050	ASTM D70 or D3289
2	Penetration@25° C	Mm/10	200-300	ASTM D5
3	Softening point	°C	31 Min	ASTM D36
4	Ductility@25° C	Cm	100 Min.	ASTM D113
5	Loss on heating	Wt%	1 Max.	ASTM D6
6	Drop in penetration after heating	%	37 Max.	ASTM D5
7	Flash point	°C	177 Min	ASTM D92
8	Solubility in Trichloroethylene	Wt%	99.0 Min	ASTM D2042
9	Spot test	-	Negative	AASHTO T102
10	Viscosity@60vC	P	200±50	ASTM D2171
11	Viscosity@135 C	CST	80 Min	ASTM D2170
12	Wax conect	%	2 Max	DIN EN 12606-1

An aerial photograph of a construction site, showing a grid of rebar on a concrete slab in the bottom left corner and a large, textured area of earth or aggregate in the rest of the frame. A large, semi-transparent teal vertical bar covers the right half of the image. The text 'Build Right' is overlaid on the teal bar in a large, white, sans-serif font. The word 'Build' is on the top line and 'Right' is on the bottom line. A teal comma is positioned between the two words.

# Build Right

# Bitumen Viscosity Grade

Viscosity grade bitumen is a petroleum grade bitumen derived from crude oil. This grade of bitumen is tested and classified differently from other types of bitumen. After production, refiners test the VGs by a viscometer to classify them according to their level of viscosity in various temperatures. The viscosity test results in four VG grades of bitumen including VG10 Bitumen, VG20 Bitumen, VG30 Bitumen, and VG40 Bitumen. The higher the number, the harder the bitumen in the viscosity grading system. In comparison to penetration grade bitumen, VG bitumen grades are more reliable and easier to handle (both mixing and compaction) and their resistance to temperature changes is more predictable. Two main factors that help us decide are traffic conditions and climate. For example, VG10 bitumen suits repairing and spraying applications, but VG30 is recommended for road construction where extra heavy traffic is expected. Each grade of viscosity bitumen has certain applications and performs differently in various temperatures. VG 10, for instance, is widely used in spraying applications and surface coating.



## VG10 bitumen

VG10 bitumen is the softest grade of viscosity bitumen. This type of bitumen is widely used for spraying applications and surface coating. VG 10 bitumen means that your bitumen is also suitable for paving roads in a very cold and cold climate instead of the old 80100/ penetration grade. The air temperature that matches VG10 bitumen ranges from -100C to 250C. Due to the high temperatures in hot climatic zones, the application of VG10 cannot provide desirable rutting resistance. This type of bitumen is also used to manufacture bitumen emulsions and modified bitumen products.

As a viscosity grade bitumen, VG10 has a better performance in cold weather

No.	Analysis	Limit	Test Method
1	Absolute viscosity at 60°C, Poises	Min 800	IS 1206 (Part 2)
2	Kinematic Viscosity at @135°C, eat	Min 250	IS 1206 (Part 3)
3	Flash point (Cleveland Open Cup), °c	Min 220	IS 1209
4	Solubility in Trichloroethylene, %	Min 99	Is 1206
5	Softening point (R&B), °C	Min 40	Is 1205
6	penetration@25°C, 0.1 mm 100gm, 5 Sec	80-100	Is 1203
7	Drop in Penetration after heating	20 Max	ASTM D92 and D6
8	Test on Residue From thin film oven tests / RTFOT		
9	Viscosity Ratio at 60°C	Max 4.0	Is 1206 (part 2)
10	Ductility at 25°C, Cm, after thin film over test	Min 40	Is 1208
11	Specific Gravity@27/27°C	Min 0.99	Iso 1202

## VG-20 bitumen

VG-20 bitumen is a grade of viscosity bitumen used in cold climatic and high altitude regions. This grade of bitumen is suitable for road construction in regions with 30 to 37 °C average temperature. In North India, VG-20 is used for road construction in hot mix asphalt. The standard penetration value of bitumen viscosity grade VG-20 is 60 mm at 25 °C. The absolute viscosity of VG-20 bitumen is 1600 to 2400 poise at 60 °C.

This bitumen is primarily used for the construction of extra-heavy bitumen pavements that have to bear significant traffic loads. Bitumen VG30 is the most widely used type of bitumen in road construction, insulation, building construction industries, and also in the production of cutback bitumen

1	Analysis	Limit	Test Method
2	Absolute viscosity at 60°C, Poises	Min 1600	IS 1206 (Part 2)
3	Kinematic Viscosity at @135°C, eat	Min 300	IS 1206 (Part 3)
4	Flash point (Cleveland Open Cup), °c	Min 220	IS 1209
5	Solubility in Trichloroethylene, %	Min 99	Is 1206
6	Softening point (R&B), °C	Min 45	Is 1205
7	penetration@25°C, 0.1 mm 100gm, 5 Sec	60-80	Is 1203
8	Drop in Penetration after heating	20 Max	ASTM D92 and D6
9	Test on Residue From thin film oven tests / RTFOT		
10	Viscosity Ratio at 60°C	Max 4.0	Is 1206 (part 2)
11	Ductility at 25°C, Cm, after thin film over test	Min 40	Is 1208
12	Specific Gravity@27/27°C	Min 0.99	Iso 1202

## VG 30 bitumen

VG 30 bitumen is a popular grade of bitumen in India. Indian importers prefer this type of bitumen because its performance in Indian road construction is proved. VG 30 grade bitumen is also used for plastic roads in India. Because of having good thermal susceptibility, we use VG30 in areas that have a higher temperature. VG-30 bitumen is also suitable for use in hot and rainy weather conditions instead of bitumen penetration grades. The more viscose the bitumen, the fewer the chance of being affected by water.

The difference between VG10 and VG-30 bitumen is in their viscosity level. Bitumen VG30 is more viscose than bitumen VG 10 and as a result, performs better in road construction in hot regions.

No.	Analysis	Limit	Test Method
v	Absolute viscosity at 60° C, Poises	Min 2400	IS 1206 (Part 2)
2	Kinematic Viscosity at @135° C, eat	Min 350	IS 1206 (Part 3)
3	Flash point (Cleveland Open Cup), °c	Min 220	IS 1209
4	Solubility in Trichloroethylene, %	Min 99	Is 1206
5	Softening point (R&B), ° C	Min 47	Is 1205
6	penetration@25° C, 0.1 mm 100gm, 5 Sec	50-70	Is 1203
7	Drop in Penetration after heating	20 Max	ASTM D92 and D6
8	Test on Residue From thin film oven tests / RTFOT		
8	Viscosity Ratio at 60° C	Max 4.0	Is 1206 (part 2)
9	Ductility at 25° C, Cm, after thin film over test	Min 40	Is 1208
10	Specific Gravity@27/27° C	Min 0.99	Iso 1202

## VG40 bitumen

VG40 bitumen is used in areas in which high pressure comes from heavy traffic loads, such as intersections, near tolls booths, and truck parking lots. Due to the high viscosity of this bitumen, it is more appropriate for improving resistance to shoving and other problems associated with higher temperatures and heavy traffic loads. We not only control the test results of VG 40 and other our company production's but also measure the properties of bitumen before loading. In cooperation with SGS inspectors, we do an extremely careful sampling and testing of VG 40 bitumen and send the results to our clients.

No.	Analysis	Limit	Test Method
1	Absolute viscosity at 60° C, Poises	Min 2400	IS 1206 (Part 2)
2	Kinematic Viscosity at @135° C, eat	Min 350	IS 1206 (Part 3)
3	Flash point (Cleveland Open Cup), °c	Min 220	IS 1209
4	Solubility in Trichloroethylene, %	Min 99	Is 1206
5	Softening point (R&B), ° C	Min 47	Is 1205
6	penetration@25° C, 0.1 mm 100gm, 5 Sec	50-70	Is 1203
7	Drop in Penetration after heating	20 Max	ASTM D92 and D6
8	Test on Residue From thin film oven tests / RTFOT		
9	Viseosity Ratio at 60° C	Max 4.0	Is 1206 (part 2)
10	Ductility at 25° C, Cm, after thin film over test	Min 40	Is 1208
11	Specific Gravity@27/27° C	Min 0.99	Iso 1202

## **General Description of Performance Grade (PG) Bitumen:**

Performance Grade (PG) Bitumen is bitumen which is graded based on its performance at different temperatures. In Super pave grading system, binders are classified according to their performance in extreme hot and cold temperatures and called as performance grade (PG) bitumen. The main purpose of grading and selecting asphalt binder using the PG system is to make certain that the binder has the appropriate properties for environmental conditions in the field. PG asphalt binders are selected to suit the expected climatic conditions as well as volume adjustments and traffic speed. Therefore, the PG system uses a set of tests to measure physical properties of the binder which can be directly related to field performance in the paving situation.

### **Performance Grade (PG) Bitumen Nomenclature**

Performance Grade (PG) bitumen is categorized based on traffic and pavement temperature. Modification and monitoring done here, are meant to simulate conditions and traffic volumes to enable us to longer the life span of the pavement and enhance the quality. Performance Grading Should consider the actual conditions of different paving projects, since it's dominantly used for paving, such as strain relationship under the field load, traffic speed and volume and the pavement structure.

### **Performance Grading Should**

Include measures describing stress strain Relationships under field loading.

Consider the pavement conditions

Temperature, traffic speed, traffic volume, and pavement structure.

Include acceptance limits derived from experience and actual field performance:

Variables that affect Binder Selection

### **Geographic Area:**

Air Temperature, solar radiation

Pavement Temperature: Max & Min

Traffic volume: High, Medium, Low

Traffic speed: Fast, Slow

Pavement Structure: Strong, Weak

Stress and strain

### **Methods of Selection**

Select base grade based upon

Geographic Area

Air Temperature

Pavement Temperature

Adjust base grade based upon

Traffic Speed

Traffic Volume



**PG5228-** is dominantly used in paving for both new construction and road care and also in both dense-graded and open graded Hot Mix Asphalt (HMA). This product could also be used for sealing cracks in paving and also the edges. Other applications include spraying in places like bridge deck and pavement protective membrane with fabrics.

**PG5822-** is initially used in paving for both dense-graded and open graded Hot Mix Asphalt (HMA) and also in road construction usages as well as spraying and crack sealing applications.

This grade is widely used in very cold areas.

**PG5834-** is generally used in the higher elevation roadways. This grade

is a paving asphalt cement dominantly used for the production of Hot Mix Asphalt (HMA). It could also be used for sealing the edges of new to old paving and cracks sealing.

**PG5840-** is primarily used on the high elevation locations. This grade is paving asphalt for the production of Hot Mix Asphalt (HMA). It can be easily used for sealing purposes and crack treating as well.

**PG6422-** is mostly used in paving for both new construction and pavement treatment projects and in both dense-graded and open graded Hot Mix Asphalt (HMA) as well as others. It can be easily used for sealing purposes and crack treating too. Other uses include spray applications for bridge decks and pavement protective layer with fabrics and some modifications. It has been reported that with proper aggregate selections and asphalt content, HMA with PG6422- as the binder may show less tenderness compared to a similar mixture with a lower viscosity/softer asphalt. This will lead to a significant reduction of typical tenderness problems of mixture shoving and checking during pavement surface scuffing and rolling and markings caused by traffic immediately after paving.

**PG6428-** is primarily used in road construction and paving for new and pave care projects and in both dense-graded and open-graded HMA. Other uses include spray applications for bridge deck and pavement protective layer with fabrics. PG6428- is generally used for the locations with low elevation.

**PG7022-** is primarily used in areas with high traffic volume and is also the paving asphalt cement used for the production of Hot Mix Asphalt (HMA). This grade is also a good choice for sealing the edges of pavement and for crack sealing.

**PG Grades with the best resistance in thermal cracking**

PG 64 -22

- PG 76 -22
- PG 64 -28
- PG 58 -34

**PG Grades with the best resistance against rutting**

PG 82 -22

- PG 76 -28
- PG 70 -28
- PG 76 -22

**Common in toll roads (high Volume)**

PG 64- 22

**Common in toll booth (high volume and slow traffic)**

PG 70- 22

**Common in rest area (high volume and standing traffic)**

PG 76- 22





## Oxidized Bitumen

The refinery bitumen is further treated by the introduction of processed air. This will give us oxidized bitumen. By maintaining a controlled temperature, the air is introduced under pressure into soft bitumen. Compounds of higher molecular weight are formed by the reaction of this introduced oxygen and bitumen components. Thus, the Asphaltenes and the Maltenes content increases resulting in a harder mix. This harder mix has a lower ductility and temperature susceptibility. The oxidized bitumen is used in industrial applications such as roofing and coating for pipes. By this method of processing, the bitumen that has a lower penetration can be manufactured, which can be employed for paving roads



## **Cutback Bitumen:**

These are a grade of bitumen that comes under penetration grade bitumen. This type of bitumen has a temporarily reduced viscosity by the introduction of a volatile oil. Once after the application, the volatile material is evaporated and bitumen gain its original viscosity.

The penetration grade bitumen is a thermoplastic material. It shows the different value of viscosity for different temperature. In areas of road construction, it is necessary for the material to be fluid in nature at the time of laying i.e. during surface dressing.

It is also essential for the material to regain back to its original hardness and property after setting. This is ensured by cutback bitumen. The fluidity is obtained for any bitumen by raising the temperature. But when it is necessary to have fluidity at lower temperatures during surface dressing, cutback bitumen is employed.



## **Bitumen Emulsion**

This type of bitumen forms a two-phase system with two immiscible liquids. One of them is dispersed as fine globules within the other liquid. When discrete globules of bitumen are dispersed in a continuous form of water, bitumen emulsion is formed. An emulsifier having a long hydrocarbon chain with either a cationic or anionic ending is used for dispersing the bitumen globules. This emulsifier provides an electrochemical environment. The ionic part of the chain has an affinity towards water and the bitumen is attracted by hydrocarbon part. The emulsions can be cationic (positive charge) or anionic (negatively charged). The globules of the same charge hence repel each other, making the whole system stable. To facilitate adhesion with the aggregates (that are negatively charged), cationic emulsions are more preferred.

### **Types of bitumen emulsifier and its quantity:**

**Water evaporation rate**  
**Bitumen quantity**  
**Bitumen globules size**  
**Mechanical forces**



The emulsions are applied by using sprays. For this viscosity is a primary concern. With the increase of bitumen content, the mixture becomes more viscous. This is found to be sensitive when the amount exceeds 60%



# Applications of emulsions:

## Slurry Surfacing

Finely ground dense-graded aggregate is mixed with emulsion and water to form a slurry which is spread over the road surface at thicknesses in the range 3–30mm depending on the aggregate top size. The process is usually done with a specially made mix-paver, although slurries can be hand-applied, and the emulsions used are generally cationic medium or slow setting types.

Depending on the choice of emulsifier, the system may provide a quick-setting slurry which can be trafficked within 60 minutes, or slower setting materials suitable for handwork. Slurry Surfacing in thick layers with quick setting polymer-modified slurries is called micro surfacing. For best results the emulsion reactivity should be matched to that of the aggregate, but additional chemicals may be added on the paver to adjust the setting rate.

## Plant Mixes

Structural materials can be from emulsion and crushed aggregates or reclaimed asphalt pavement which meet the same demands as hot mix. Depending on the aggregate gradation, medium or slow-setting emulsions can be used. Cold mixes which combine bitumen emulsion with cement can give much improved bearing capacities.

## Cold In-place Recycling

Surface courses or even the full depth of the roadway can be recycled in place either by a specially built mobile plant or by simple equipment. Cold recycling uses bitumen emulsions either alone or in combination with cement or lime. Typically, a cationic slow-setting emulsion is used.

## Soil Stabilization

Cationic slow-setting emulsions can be used for stabilization of uncrushed naturally occurring gravels and sandy soils. Generally, soils with a sand equivalence value of more than 25 (measure of clay content) can be treated with some degree of success for use as a base material for hot overlay or for minor roads where a seal coat may be sufficient. Materials of even lower sand equivalence can in some cases be treated with a combination of emulsion and a hydraulic binder such as lime or cement.

### Prime Coats

Emulsion prime coats are applied to unbound sub-bases in order to seal the surface before the application of the asphalt layers. The primer seal prevents the ingress of water into the layer, loss of fines from wind or water erosion and ideally allows construction vehicles to drive over the surface without pick up on tyres. A few centimetres of penetration is readily achievable if the compacted material is not too dense but may be very difficult in practice with fine graded and highly compacted bases. Penetration can be achieved using very slow set cationic or anionic emulsions containing solvent but, in some cases, deep penetration can be very difficult.

However, current thinking says that deep penetration may be unnecessary as dense and highly compacted bases are already very robust and merely need to be sealed from water intrusion. A very thin primer application with minimal penetration is then sufficient. It is still important that the binder should not be picked up on the tyres of construction vehicles and this can be achieved by using a very hard grade bitumen with a rapid setting emulsion formulation.

### Tack Coats

Tack coats are light application of bitumen between layers of hot mix to prevent slippage. There is considerable variation in the type of emulsion used for tack coats worldwide. In many countries slow-setting anionic or cationic emulsions are used which may be diluted with water, but Europe uses rapid-setting cationic emulsions. It is necessary for the tack coat to wet out any dust on the surface of the lower layer and this favours emulsions of small particle size and some solvent content. New developments are for tack coats based on very hard binders which cure rapidly and avoid sticking to the tires of traffic or construction equipment.

### Fog Seal

A light application of diluted emulsion restores bitumen to weathered surfaces and extends roadway life at low cost.

## **Why Tosan Petro?**

### **.specialized team for sales and export of bitumen**

The most reputable bitumen sales and trading company in the Middle East, along with successful and experienced experts in the field of buying, selling and exporting all types of bitumen.

### **.international analyzes for all types of bitumen**

international analyzes and approvals for exporting all types of bitumen.

### **.Diverse and flexible methods for international payments**


Possibility for payment in TT and LC term in domestic and export market of bitumen.

### **.Successful long history in manufacturing, selling and exporting all kinds of bitumen.**

company's successful expertise and long history have been able to create the best returns and results for all customers.

### **.Reasonable and appropriate prices for bitumen**

The most up-to-date and appropriate prices for supplying bitumen in domestic and export markets.

The background of the page is a photograph of an industrial refinery. Several tall, dark silhouetted towers and distillation columns are visible against a sky that transitions from a pale blue on the left to a warm orange and yellow on the right, suggesting a sunset or sunrise. The towers are interconnected with a complex network of pipes, ladders, and structural steel. The overall scene is industrial and atmospheric.

## **.Specialized team for domestic and international transportation of bitumen**

the most specialized and experienced bitumen transportation company in the Middle East.

## **.Offering variety of packaging for all grades of bitumen**

Based on customer's requests, any required packaging will be delivered with high quality.