

ROAD PAVING BITUMEN

BITUMEN HISTORY

Bitumen is the oldest known engineering material and has been used from the earliest times as an adhesive, sealant and waterproofing agent. As long ago as 6000BC the thriving ship-building industry in SUMERIA used naturally occurring bitumen, found in surface seepage in the area in the Indus Valley, now in Pakistan, there is a particularly well-preserved water tank which dates back to around 3,000 BC. The stone blocks in the tank's walls are bonded with natural bitumen and there is a vertical bituminous core in the centre of the wall this same principle is used today in modern dam design.



It is believed that Nebuchadnezzar (The King of Babylon who is credited with the construction of the Hanging Gardens of Babylon) was one of the early exponents of bitumen as there is evidence that he used the material for waterproofing the masonry in his palace and as grout for stone road.

Bitumen's versatility as a construction material is unparalleled. Having been used as an adhesive, sealant and waterproofing agent for over 8,000 years, its uses now include: the construction and maintenance of roads, airfields and all areas where asphalt is used; roofing; damp proofing; dam, reservoir and pool linings; soundproofing, pipe coatings, paints, and many other applications.



There appears to have been little development in materials used until the 19th century when the refining of bitumen from crude petroleum oils began. The vast majority of bitumen used by today's construction industry is refined bitumen, derived from crude oil. It is a sophisticated product available in many forms and grades developed by the bitumen industry for specific uses. The process of refining bitumen was pioneered in the early 1900s, giving rise to a myriad of contemporary industrial applications.

WHAT IS BITUMEN?

The development of synthetic Bitumen started in the 19th century from crude petroleum oils. The vast majority of bitumen used by today's construction industry is refined bitumen, derived from crude oil. It is a sophisticated product available in many forms and grades developed by the bitumen industry for specific uses. The process of refining bitumen was pioneered in the early 1900s, giving rise to a myriad of contemporary industrial application.

Bitumen is essentially obtained by distillation of blended crudes containing a minimum of single bitumen crude. The others, which are lighter, go to satisfy requirements for different types of fuel and combustibles. Contrary to a common but mistaken idea, bitumen is not an oil residue that the petroleum industry wants to get rid of at little cost. In reality, to produce bitumen of good quality with constant properties, refiners meticulously select one or more bitumen crude, following very strict internal approval procedures.

Among 1300 different types of classified crude oils, only 10 % is suitable for producing refined bitumen capable of meeting the





industrial specifications. These types are known as bitumen crudes. In short, bitumen is a blend of hydrocarbons, solid and semi-solid with brown or black color. Having been used as an adhesive, sealant, and waterproofing agent for over 8,000 years, it is the most suitable product for construction and maintenance of roads, airfields and all areas where asphalt is used; roofing; damp proofing; dam, reservoir and pool linings; soundproofing, pipe coatings, paints, and many others. Asphaltic bitumen is valued for a variety of properties. It is water proof, ductile, adhesive, chemically inert and resistant to atmospheric exposure and the effects of dilute acids and alkalis.

Bitumen is produced from selected crude oils through a process of Fractional Distillation. The crude oil is heated to temperatures of between 300 and 350 degrees Celsius and fed into a distillation column allowing the lightest fractions of the crude to separate, through vaporization, from the heavier fractions, which remain liquid.

The higher boiling point fractions are drawn through heat exchanger and then through vacuum distillation columns. This process produces a "short residue" that is used to manufacture several grades of bitumen.

The pressure and temperature conditions within the vacuum process will determine the hardness of the short residue. The short residue may be further modified by 'air blowing' in which air is passed through the residue at temperatures of 250 - 300 degrees Celsius.

BITUMEN PROCESSING

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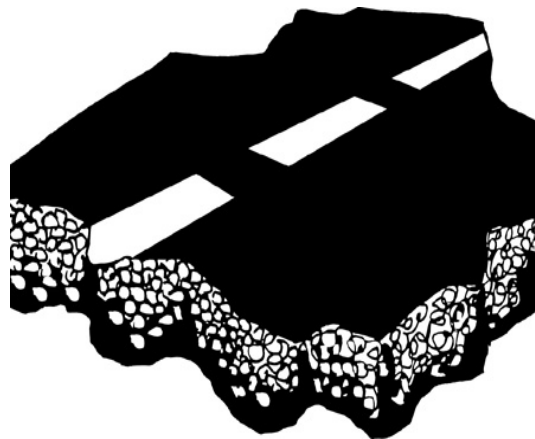
BITUMEN CHARACTERISTICS

GRADE 40/50

Harder bitumen when used in pavement is more resistance to rutting and creeping. Its high resistance to weathering provides flexibility to mobilize the highway for immediate circulation in addition to offering longer life of the pavement.

Application: 40/50 bitumen used mainly in the manufacture of hot mix asphalt for construction of new roads in asphalt concrete for heavy traffic and truck the reinforcement of roads, special application of airport runways or anywhere to support heavy loads, roads and highways with heavy traffic.

The 40/50 grade is the most appropriate material to be used for dense and heavy traffic in hot countries. The penetration is always measured in 10ths of a millimeter between 35 and 45.



GRADE 60/70

These grades are commonly used for asphalt paving in tropical climates. Their penetration measured in 10th of a millimetre is between 50 and 70 High Degree of softening, High Temperature Resistance, Harder structure than bitumen 80/100, Less energy required to make this grade ready to use than the 40/50 bitumen because Naturally Emulsifiable. Application: The 60/70 is the most commonly and suitable bitumen grade to be used for Sub-Saharan Africa with the least compromise as opposed to the other two commonly used bitumen grade in manufacturing of asphalt because they are compromises between bitumen 40/50 and 80/100 less hard drive. Bitumen grades 50/70 and 60/70 are used in the manufacture of hot mix asphalt in construction of new roads in micro-concrete, bituminous concrete and SAND-ASPHALT the main roads and motorways carrying traffic of heavy construction vehicles. These asphalts are also used in the manufacture of bitumen emulsions.

GRADE 80/100

These grades are the softer bitumen from our range. They provide the basis for the establishment of cut-back or fluxed bitumen. Their penetration measured in 10 the of a millimeter and is between 70 and 100. In the long term, these bitumen require more maintenance given the risk of rutting. These are quality bitumen with softening points lower than the 40/50 and the 60/70.

- advantage is in saving in initial heat energy,
- more elasticity than other similar products,
- good resistance to fatigue and cracking of pavement,
- Emulsifiable naturally

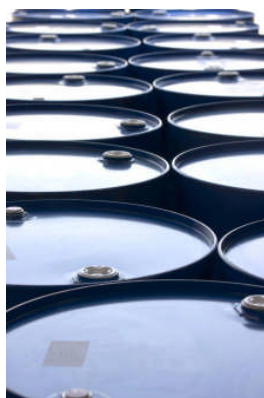
Application: These bitumen are used in hot mix asphalt manufacture for:

- coating roads in urban areas,
- re-surfacing and rehabilitation of pavement
- building roads with low traffic,
- shoulders of roads.

They are also used in the manufacture of emulsions for the implementation of surface coatings.

PACKAGE AND STORAGE

In Irony Drums and each four drums on a pallet with plastic cover and strapped.



Material: New Cold Rolled Steel
Color: Black

The recommended size: Nominal size = 185Kg packaged in New Steel Drum

DESCRIPTION	VOLUME PER 20' CONTAINER	WEIGHT PER DRUM	No. of DRUMS per container
Net Weight	18.5mts (+/-3%)	150kgs (+/-3kgs)	123
Gross Weight	19.6mts (+/-3%)	158kgs (+/-3kgs)	123
Net Weight	19.8mts (+/-3%)	182kgs (+/-3kgs)	110
Gross Weight	20.9mts (+/-3%)	192kgs (+/-3kgs)	110
Net Weight	16.0mts (+/-3%)	210kgs (+/-3kgs)	80
Gross Weight	17.4mts (+/-3%)	220kgs (+/-3kgs)	80

HEALTH AND SAFETY DATA

Do not heat the product to a temperature exceeding 230° C.

Detailed information on health and safety for these products is provided in MSDS (Material Safety Data Sheet).