



## Complete Professional Overview

AIF Trading® – Alexandria International for Trading & Contracting (AIF Trading) This document provides a comprehensive overview of bitumen, a crucial material in construction and various industrial applications. It covers the origin and extraction methods, different types, applications, global producers and consumers, market size, logistics, quality standards, and strategic importance of bitumen. This overview aims to provide a clear understanding of the bitumen market and its significance in global infrastructure development.

## 1. Introduction

Bitumen, also known as asphalt, is a viscous, black, semi-solid hydrocarbon material. It is derived from crude oil refining or occurs naturally. Its primary use is as a binder in road construction and waterproofing applications. Bitumen is valued for its durability, adhesion, and resistance to water, making it an essential component in various construction and industrial processes.

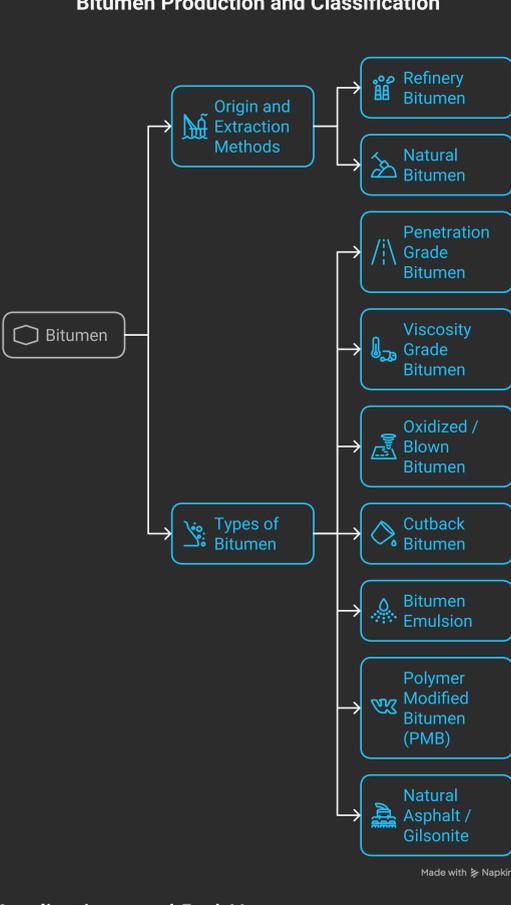
## 2. Origin and Extraction Methods

Bitumen is obtained through two main routes:  
**A) Refinery Bitumen:** This type of bitumen is produced during crude oil vacuum distillation. The process involves removing lighter fractions from crude oil, leaving bitumen as the final residue. This is the most common method of bitumen production.  
**B) Natural Bitumen:** Natural bitumen is extracted from oil sands and natural asphalt deposits. Significant deposits are found in countries like Canada and Venezuela. Extraction methods vary depending on the deposit type and can include surface mining or in-situ techniques.

## 3. Types of Bitumen

- Bitumen is classified into several types based on its properties and applications:
- Penetration Grade Bitumen:** This is commonly used in road construction. Grades are specified by their penetration value, indicating hardness (e.g., 40/50, 60/70, 80/100). Lower penetration values indicate harder bitumen.
  - Viscosity Grade Bitumen:** Engineered for temperature control, viscosity-graded bitumens are selected based on the climate and traffic conditions of the road. Common grades include VG10, VG30, and VG40, with higher numbers indicating higher viscosity at a standard temperature.
  - Oxidized / Blown Bitumen:** This type is produced by blowing air through bitumen at high temperatures, which increases its softening point and reduces its temperature susceptibility. It is commonly used in roofing, insulation, and membrane production.
  - Cutback Bitumen:** Cutback bitumen is produced by dissolving bitumen in solvents such as kerosene or naphtha. This reduces its viscosity, making it easier to apply at lower temperatures. It is used for cold application in road construction and maintenance.
  - Bitumen Emulsion:** This is a mixture of bitumen, water, and emulsifiers. The emulsifiers help to keep the bitumen dispersed in the water, creating a stable emulsion that can be used for surface treatments and tack coats.
  - Polymer Modified Bitumen (PMB):** PMB is bitumen that has been modified with polymers to enhance its elasticity, durability, and resistance to deformation. It is used in high-stress applications such as airport runways and heavily trafficked roads.
  - Natural Asphalt / Gilsonite:** This is a naturally occurring asphalt that is mined and used in specialty industrial applications such as paints, coatings, and drilling fluids.

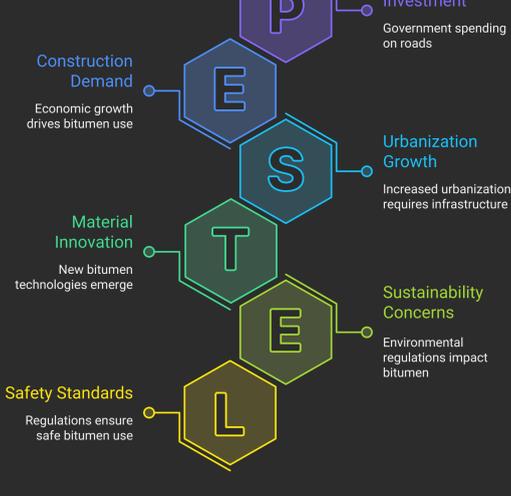
### Bitumen Production and Classification



## 4. Applications and End-Users

- Bitumen has a wide range of applications across various industries:
- Road and Highway Construction:** The primary application of bitumen is as a binder in asphalt pavements. It provides cohesion and adhesion to the aggregate, creating a durable and waterproof road surface.
  - Airport Runways:** PMB is often used in airport runways due to its ability to withstand heavy loads and extreme temperatures.
  - Waterproofing Membranes:** Bitumen is used in the production of waterproofing membranes for roofs, basements, and other structures.
  - Roofing Felts and Shingles:** Oxidized bitumen is used in the manufacture of roofing felts and shingles to provide a waterproof and durable roofing material.
  - Pipe Coating and Corrosion Protection:** Bitumen coatings are used to protect pipelines from corrosion and extend their lifespan.
  - Dams, Bridges, and Tunnels:** Bitumen is used in the construction of dams, bridges, and tunnels to provide waterproofing and structural support.
  - Industrial Flooring:** Bitumen-based flooring is used in industrial settings due to its durability and resistance to chemicals and abrasion.
  - Paints, Sealants, and Insulation:** Bitumen is used as a component in paints, sealants, and insulation materials to provide waterproofing and weather resistance.

### Bitumen Applications and End-Users



## 5. Global Producing and Exporting Countries

Bitumen production and export are concentrated in several regions:

- Middle East:** Saudi Arabia, UAE, Iran, Iraq, Kuwait, Bahrain, Oman
- Asia:** China, India, South Korea, Japan, Singapore, Thailand, Malaysia
- Europe:** Russia, Netherlands, Spain, Italy, Germany, France, UK
- Americas:** USA, Canada, Venezuela, Mexico, Brazil
- Africa:** Egypt, Algeria, Libya, Nigeria

## 6. Global Importing and Consuming Countries

The major bitumen importing and consuming countries are:

- Africa:** Egypt, Kenya, Tanzania, Ghana, Nigeria, Ethiopia, Senegal
- Asia:** India, Bangladesh, Pakistan, Sri Lanka, Indonesia, Philippines, Vietnam
- Europe:** UK, Germany, France, Italy, Poland
- Americas:** USA, Chile, Peru, Colombia
- Oceania:** Australia, New Zealand

## 7. Market Size and Trade

The global bitumen market is substantial, exceeding USD 90 billion annually. The demand is driven by infrastructure expansion, road rehabilitation, and urban development, particularly in emerging economies. Trade patterns involve the movement of bitumen from producing regions to consuming regions, with significant volumes transported by sea and land.

## 8. Logistics and Transportation

Bitumen is transported in bulk via heated tankers, jumbo bags, or bitutainers depending on destination and infrastructure. Maintaining the temperature of bitumen during transportation is crucial to prevent solidification. Specialized tankers and containers are used to ensure the bitumen remains in a liquid state.

### Global Bitumen Trade



## 9. Quality Standards

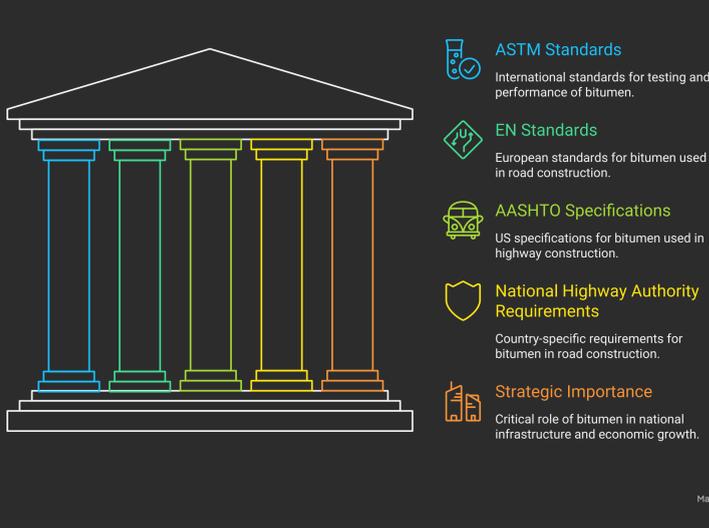
Bitumen quality is governed by various international and national standards:

- ASTM Standards:** Developed by ASTM International, these standards specify the testing methods and performance requirements for bitumen.
- EN / European Standards:** These standards are used in Europe and specify the requirements for bitumen used in road construction and other applications.
- AASHTO Specifications:** The American Association of State Highway and Transportation Officials (AASHTO) develops specifications for bitumen used in highway construction in the United States.
- National Highway Authority Requirements:** Many countries have their own national highway authorities that set specific requirements for bitumen used in road construction.

## 10. Strategic Importance

Bitumen is a backbone material for national infrastructure development, public transportation networks, and industrial protection systems. Its availability and quality are critical for economic growth and development.

### Bitumen Quality Framework



## 11. Conclusion

Bitumen remains a strategic commodity linking oil refining to infrastructure, industrial growth, and long-term economic development. Its diverse applications and essential role in construction and industrial processes ensure its continued importance in the global economy.

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