



Products

The 150,000 barrels per day Refinery produces all fuel based refinery products:

- Liquefied Petroleum Gas (LPG) and Superior Kerosene Oil (SKO) for households and industrial uses.
- Motor Spirit (Petrol) and Hi-speed Diesel for automobiles.
- Naphtha, the major raw material for fertilizer and petrochemical industries.
- Furnace Oil (FO), Light Diesel Oil and Low Sulphur Heavy Stock (LSHS) for fuel in industries.
- Aviation Turbine Fuel (ATF) for aircrafts.

Specialties

- Benzene for manufacture of caprolactum, phenol, insecticides and other chemicals
- Special Boiling Point Spirit (SBPS) used as solvent in tyre industry
- Toluene for manufacture of solvents and insecticides, pharmaceuticals and paint
- MTO (Textile grade) and MTO (Paint grade) for use in textile and paint industry
- Sulphur for use in fertilizer, sugar, chemicals and tyre industry.

KR's exclusive premium product:

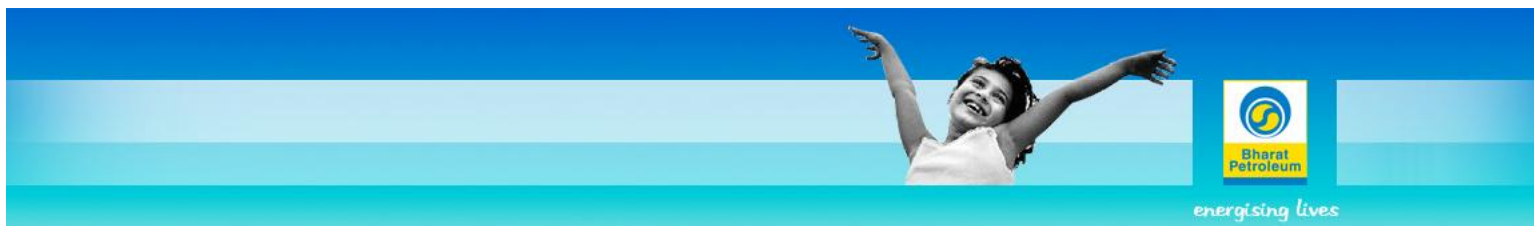
Natural Rubber Modified Bitumen (Rubberised Bitumen) (NRMB)

Natural Rubber Modified Bitumen (NRMB) is one of Kochi Refinery's premium products that revolutionized road development. NRMB has been on a fast track since its introduction in 1999.

Bitumen, which is derived from petroleum, is a critical component in road building. Polymer added to Bitumen enhances both quality and longevity of roads. Kochi Refinery in association with leading research institutes made an in-depth study on feasibility of using natural rubber available in abundance in Kerala, to develop the premium product, NRMB.

NRMB has improved many roads throughout the region. Its success track is evident from the smooth Seaport-Airport road in Cochin.

NRMB is a superior mix of bitumen and natural rubber latex. It is superior in quality to ordinary bitumen in terms of penetration, softening point and elastic recovery. NRMB is not affected by temperature fluctuations-less bleeding at high temperature and less cracking at low temperature. Improved skid resistance and more service life are the booster effects along with prime factors like save fuel, reduces traffic noise pollution and atmospheric pollution. All this sums up to reduced road maintenance cost.



Specifications of Rubberised Bitumen as approved by Indian Road Congress Vs. Ordinary Bitumen

Specifications/(Units)	Significance	Rubberised Bitumen	Ordinary Bitumen
*Elastic Recovery half tread in ductilometer at 150 C (%)	Deformation due to load	35 (Min)	10-12
Penetration at 250 C (0.1mm, 100 g, 5 sec)	Hardness - Consistency	50-89	80-100 & 60-70
Softening point - R&B (°)	Lower softening point results in softening of the surface		

- The most important property of Rubberised Bitumen is its elastic recovery. The elastic nature of Rubberised Bitumen prevents rutting (permanent deformation due to the load over the road).

Unique Products

BITUMEN EMULSION

Bitumen in different grades is used for road maintenance and construction. The bitumen requires heating for the temporary reduction of viscosity. With bitumen emulsion, which is a ready to use product, there is no need for the preliminary heating. Reduced road maintenance cost, energy savers, economical, longer service life for roads and reduced atmospheric pollution during road laying/maintenance are some of the advantages of Bitumen Emulsion.

The following grades of Bitumen Emulsion are produced in Kochi Refinery meeting IS 8887:2004 specifications.

- Bitumen Emulsion Rapid Setting-1 (BERS-1)
- Bitumen Emulsion Rapid Setting-2 (BERS-2)
- Bitumen Emulsion MediumSetting-1 (BEMS-1)
- Bitumen Emulsion Slow Setting-1 (BESS-1)
- Bitumen Emulsion Slow Setting-2 (BESS-2)

DIESEL ADDITIVE

After years of pure and applied research, Kochi Refinery hit upon the formula for high performing Diesel. Kochi Refinery's Diesel Additive is an indigenous product successfully tested in laboratories both locally and globally.

Trials at various stages in various types of vehicles have also been completed. When used along with diesel in a specified proportion, it improves the combustion inside engine cylinder, thereby reducing harmful exhaust emissions and assuring better fuel efficiency.



Diesel Additive is suitable for all engines, which use diesel as fuel like automobiles, boats, power generators, locomotives, etc. It helps enhancing the engine efficiency through faster rate of heat release. It also keeps the cylinder peak pressure to the optimum level, which means the system requires less energy to maintain relatively low pressure and thus allowing the engine to run smoothly. Immediate results on these changes in combustion pattern are reduction in engine noise level and smooth drive. In the long run this effect improves engine life and longer change period of engine oil.

Diesel Additive is a petroleum product, which burns out completely along with diesel fuel and hence will not foul the injector nozzle tip by clogging even at high pressures.

POLY ISOBUTENES

Polyisobutenes (PIB) for manufacture of lubricants, cable, jelly.

New products:

Bitumen Emulsion, a new eco-friendly product was launched by erstwhile KRL in June 2005. The first batch of EURO-III Motor Spirit was dispatched in January 2006 and EURO-III High Speed Diesel was dispatched in December 2005 with existing facilities and without any additional investment.