

TECHNICAL DATA SHEET CUTBACK MC -30

Cutback bitumen is a range of binders that are produced by blending (mixing) penetration grade bitumen and a hydrocarbon solvent, such as paraffin or mineral turpentine.

When the solvent has evaporated, the binder returns to its original penetration grade to tie the particles together. Cutback bitumen gets its name from the solvent that is involved in the process, because the solvent "cuts back" or evaporates, leaving behind the binder to "get on with the job". The solvent used in cutback bitumen is called the "cutter" or "flux".

Three types of solvents are used for the blending process: slow-curing, medium-curing or rapid-curing solvents. The latter two are the most common in South Africa. The choice of the solvent determines the rate at which the bitumen will cure when exposed to air. A rapid-curing (RC) solvent will evaporate faster than a medium-curing (MC) solvent. Curing relates to the evaporation rate of the solvent which influences the setting time of the bitumen. The viscosity of the cutback bitumen is determined by the proportion of solvent added: the higher the proportion of solvent, the lower the viscosity of the cutback.

Cutbacks differ from penetration grade bitumen in that they are more workable — in other words, they can be more easily reshaped. Less heat is required to liquefy cutback bitumen than penetration bitumen, making it easier to use at lower temperatures.

Typical cutback bitumen's are MC 30 and RC 250. The letters in the name refer to the curing action of the solvent, and the number to the viscosity of the binder.

The advantage Cutbacks have over Emulsions is a much higher residual Bitumen percent, typically over 80% compares with over 40-65% for Bitumen emulsions. The result is more Bitumen left on the roadway after curing, for the same volume of binder applied.

Environmental regulations. Cutback asphalts contain volatile chemicals that evaporate into the atmosphere. Emulsified asphalts evaporate water into the atmosphere.

Loss of high-energy products. The petroleum solvents used require higher amounts of energy to manufacture and are expensive compared to the water and emulsifying agents used in emulsified asphalts.

Manufacture of cutback bitumen

Cutback bitumen are manufactured by blending either 80/100 pen bitumen with kerosene to comply with a viscosity specification. The majority of cutback bitumen is used in the surface dressing but a significant amount is also used for the Manufacture of both standard and deferred set asphalts.

In addition to STV tests and solubility, cutback bitumen's have to comply with a distillation specification I621 and a penetration requirement on the residual bitumen. This ensures that during application and in service, the diluent will evaporate at a consistent and predictable rate and that the residual bitumen will have the appropriate properties in service.

GKUC has three groups of cutback bitumen: rapid curing (RC) where petrol/gasoline is used as a solvent, medium curing (MC) containing kerosene and slow curing (SC) made with diesel oil. The viscosity is measured with a capillary tube viscometer at 60C. The flow through the viscometer is induced by the gravity, and vacuum is not needed. The viscosity is expressed in centistokes whereas, for pure bitumen, the viscosity is expressed in poise. The units of poise and strokes are related to each other through the density of the tested material.



Specification of cutback bitumen

- Cutback bitumen is a blend of penetration grade bitumen and petroleum
- Solvents
- The choice of the solvent determines the rate at which the bitumen.
- Will "set up" or cure when exposed to air.
- A rapid-curing (RC) solvent will evaporate more quickly than a medium-curing (MC) solvent.
- The viscosity of the cutback bitumen is determined by the proportion of solvent added - the higher the proportion of solvent, the lower is the viscosity of the cutback.
- The solvent used in cutback bitumen is sometimes also referred to as the "cutter" or "flux".
- When the solvent has evaporated, the binder reverts to the original penetration grade.

Advantage of cutback bitumen

It can be applied at lower temperatures than penetration grades because of its lower Bitumen Solvents viscosity. A disadvantage is that cutback bitumen consumes non-renewable energy resources which are ultimately lost through evaporation.

Application of Cutback Bitumen in Bituminous (asphalt) Pavement Construction and Maintenance.

Prime and Tack Coating The process of priming involves applying a low viscosity binder to a prepared but usually unbound aggregate base. It is intended to be absorbed by the top layers of the base and provide a surface more easily 'wetted' by a subsequent bituminous covering. The primer will be able to carry traffic for a short time (although this practice is uncommon) and help control dust. Generally, primers are applied at rates between 0.5 and 1.4 L/m². Cutback bitumen's suitable for priming are also used for tack coats, which are applied to an underlying surface to help with the adhesion of subsequent asphalt layer. A typical application rate is between 0.2 and 0.4L/m².

Prime Sealing

Where temperatures are too cool for an effective priming operation, or where traffic is likely to upset a primed surface before the final seal can be sprayed, a primer seal can be used to give adequate protection of the pavement for periods of up to 6 to 12 months. Cutback bitumen's suitable for primer sealing can also be used in the manufacture of pre-mix asphalt, which is used in patch repairs

Spray Sealing

Cutback bitumen's are used extensively in sprayed sealing applications, particularly in cooler weather where they provide improved initial stone retention due to their lower viscosity. Typically, a single application of the appropriate cutback bitumen is sprayed onto the primed pavement onto which aggregate is laid

Cutback bitumen standard

- ASTM D 2026, D 2027 and D 2028 for Slow, Medium and Rapid Curing Cutback
- AASHTO M 81, M 82 for Rapid and Medium Curing Cutback
- EN 15522 Cut back and Fluxed Bituminous Binder



General information of cutback bitumen MC -30

In many places, cutback asphalt use is restricted to patching materials for use in cold weather cutback MC-30 is medium curing (MC) cut-back asphalt consisting of penetration grade asphalt cement and diluent or cutter of medium volatility. The diluent temporarily reduces the viscosity of the asphalt cement for ease of handling and application. Cutback MC-30 use in the road maintenance industry where it is used as a prime coat of the base course prior to placing of the bituminous surface course. Its purpose is to bind the granular material of the base course to the asphalt layer. Usual application is by spray using a distributor.

Cutback bitumen MC-30 is dissolved of bitumen in solvents of kerosene. In many countries, kerosene and other volatile petroleum-derived products are added as a cutter or cutback agent to bitumen to reduce (or cutback) the viscosity of the bitumen. The mixture obtained may be called cutback bitumen.

Our MC-30 Cutback Bitumen complies with cutback petroleum asphalts of the Medium-Curing type for use in the construction and treatment of pavements as per ASTM D2028-97reapproved in 2004. Cutback Grade Bitumen is normally used in spraying and in some mixing applications. Cutback Bitumen is penetration grade bitumen blended with a solvent such as kerosene, white spirit, gasoline, and naphtha, controlling the curing time. 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. The cutback bitumen (Asphalts) supplied by GKUC are blended from petroleum grade bitumen as stated herein

Uses of cutback bitumen MC -30

Cutback agents are used to lower the viscosity of bitumen when it is applied as a primer to the surface of a road pavement aggregate base course or substrate. Kerosene is used as a bitumen cutback agent at different concentrations according to local conditions and requirements.

The cutback bitumen is ideal for prime coat and cold applied because of easy uses and no need to thinning and heating. *Cutback bitumen MC-30* consist of initial incorporation of asphalt into the surface of non-asphalt based course preparatory to any superimposed treatment of construction.

The cutback asphalt MC-30 applying to waterproofing of surfaces, plug capillary voids, coat and bond loose mineral particles.

Current common uses are in penetrating prime coats and in producing patching or stockpile mixtures. Cutback asphalt used in mixing with aggregate will usually contain an adhesion agent to assist in the coating of the aggregate surface.

Packing of cutback bitumen MC -30

This cutback bitumen bulk in the tanker and also in new steel and thick drum

Safety of cutback bitumen MC -30

- Refer to Safety Data sheets before use.
- Transport, use and store at the lowest temperature possible.
- Eliminate all potential ignition sources during application.
- Avoid breathing vapors. Avoid contact with skin.
- Always wear appropriate PPE including heat protection when used hot.
- DO NOT allow product or washings to enter storm water or sewer systems.



Specification of cutback bitumen MC -30

GKUC guarantees that the Medium Curing Cutback Grade MC-30 it supplies under its offers is produced in compliance to and is in conformity to ASTM D-2028-97 Rev 2004 and is compliant to the following specification requirements.

Specification of Cutback Bitumen MC-30

Type: **Medium-Curing**

Standard: **ASTM D2027 M-13**

Property	Min	Max	Test Method
Kinematic viscosity at 60°C mm ² /s	30	60	ASTM D2170
Flash point (tag open cup), °C	38	—	ASTM D3143
Distillation test			
Distillate, volume percent of total Distillate to 680°F(360°C)			
To 437°F (225°C)	—	35	ASTM D402
To 500°F (260°C)	30	75	ASTM D402
To 600°F (316°C)	75	95	ASTM D402
Residue from distillation to 680°F (360°C), percent volume by difference	50	—	ASTM D402
Test on Residue from distillation test			
Viscosity at 140°F (60°C)	30	120	ASTM D2170
Penetration 77°F (25°C)	120	300	ASTM D5
Ductility 77°F (25°C)	100	—	ASTM D113
Solubility in trichloroethylene %	99	—	ASTM D2042
Water, percent volume	—	0.2	ASTM D95



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