Different Grades of Bitumen Emulsion & Their Uses

Rapid Setting 1 - JS Bitumen RS1
Recommended for Tack Coat Application
Rapid Setting 2 - JS Bitumen RS2
Recommended for Surface Dressing Application
Medium Setting - JS Bitumen MS
The rate of deposition of the emulsion is delayed in order to allow mixing with clean coarse aggregates before breaking to form a continuous adhesive film without stripping. It is recommended for plant or road mixes with coarse aggregates, surface dressing and Penetration Macadam Application.
Slow Setting 1 - JS Bitumen SS1
Recommended for Fog Seal, Crack Sealing and Prime Coat Application
Slow Setting 2 - JS Bitumen SS2
Recommended for plant or road mixes with graded and fine aggregates, Cold Mixed MSS, SDBC and Slurry Seal Application
Cationic Slow Setting 1 - JS Bitumen CSS1
Recommended for Fog Seal, Crack Sealing and Prime Coat Application
Cationic Slow Setting 1H - JS Bitumen CSS1H
Recommended for Fog Seal, Crack Sealing, Slurry Seal and Prime Coat
Cationic Quick Setting 1H - JS Bitumen CQS1H
Recommended for Fog Seal, Tack Coat, and Quick Setting Slurry Seal

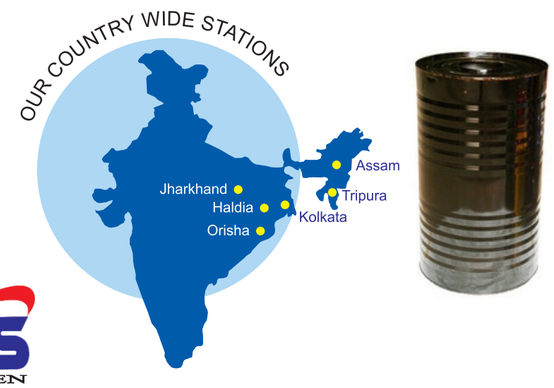
MODIFIED BITUMEN

JS BITUMEN

MODIFIED EMULSION

It is our duty to protect and preserve our mother land surrounded by the beautiful nature ensuring others to protect too.

For that our endeavour lives in using proper methods, and technological advancements giving us eco-friendly products which are capable to last long.



Potholes Repair

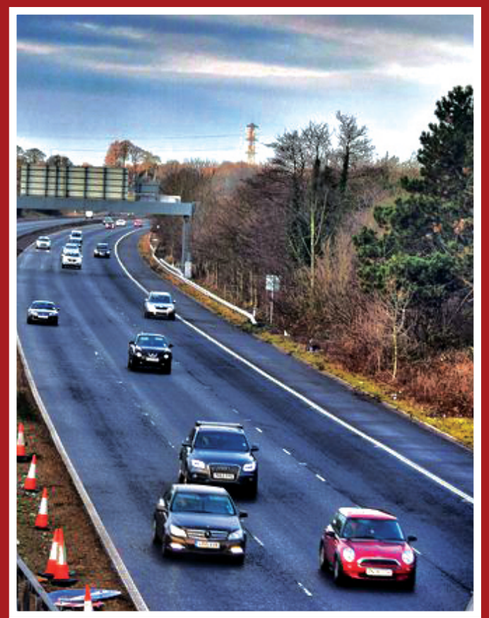
JS Bitumen-Tarfelt Industries Pvt. Ltd.

Regd. Office: 7/1A, Grant Lane, 1st Floor, Room No. 1C, Kolkata- 700012
Corporate Office: 117, Block-B, Lake Town, Kolkata- 700089
Manufacturing Plant: Vill: Nowpala, P.S. –Bagnan, District- Howrah- 711303, West Bengal, India
Ph. : +91 9331001457, +91 9331001461, +91 33 46024569
Website- www.jsbitumen.com, **E-mail**-jsbitumentarfelt@gmail.com

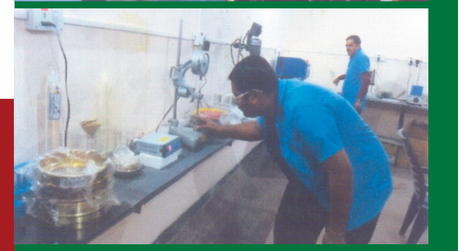
MODIFIED BITUMEN

JS BITUMEN

MODIFIED EMULSION



Cationic Bitumen Emulsion



मानकः पथप्रदर्शकः

CM/L - 5100136678

Cationic Bitumen Emulsion

JS Bitumen-Tarfelt Industries Pvt. Ltd.

An ISO : 9001 - 2015 Company

JS BITUMEN-TARFELT INDUSTRIES PVT.LTD. Is a sister Concern of **BHARAT LUB INDUSTRIES PVT.LTD**, which is engaged in manufacturing variety of petroleum products, Lubricants Etc. for the last 45 years.

Apart from these we have many other sisters concern company namely **M/S Bristol Petroleum Pvt. Ltd**. **J.K.B. Gas Pvt. Ltd.,** in service industries we have **B.B.I.T Engineering and Management College, J.I.M.S Hospital and College** under the same Management.

Since we have experience in many more petroleum products now we got entry into Bituminous Products which are also part of petroleum products.

JS Industries Vision

Since it has been a major problem, concern to road in India mainly Longibility and different climate conditions which are very much depend on quality of products, therefore we have taken interest to decrease the problem with better techno-commercial products and system.

Management:

The management of J.S.B.I Mr. Jagannath Gupta Director of the company has more than 45years experiences in managing company. One more Director Mr. Suresh Gupta has more than 30 years experience.

Quality Control:

To make better quality products we installed a fully automated plant with high speed colloidal mill to make bitumen emulsion. Our Quality control personnel have more than 18 years experience in making and maintaining quality of Bituminous Products.

To assure best quality we have full pledge laboratory for checking each and every batch of production from raw material to finished Products.

The Business:

JS Bitumen and its other sister concern companies are in the following segment of business.

- ✓ Road surfacing Products(Cationic Bitumen Emulsion, Modified Bitumen, Oxidized Bitumen, Coldmix Emulsion, Mastic asphalt, Cutback Bitumen, Paving Bitumen.
- ✓ Petroleum Products. ✓ Lubricating Products. ✓ LPG Cylinder.
- ✓ Hospital, Nursing and Medical College ✓ Management and Engineering College.

What is Bitumen Emulsion?

Bitumen Emulsion is a dispersion of Bitumen in an aqueous continuous phase, stabilized by the addition of an emulsifier. They are prepared as emulsion at high temperatures, but applied as solid dispersion at ambient temperatures. In road making, Bitumen products are typically applied with mineral aggregate.

Based on the need of customers, climate and road condition, we manufacture following grades of emulsions:

Micro surfacing

It is used in order to help preserve and protect underlying pavement structure and provide a new driving surface. polymer is commonly added to the asphalt emulsion to provide better mixture properties. The asphalt emulsion use in micro surfacing contains chemicals additives which allow it to break without relying on the sun or heat for evaporations to occur.

Slurry Seal

It is used in all over the world on highways with high traffic density roads to small residential streets. It is also preferred for the use on the airport runways as well, and absence of loose aggregates as well as excellent skid resistance is an important safety factor. Slurry Seal can be applied as thin as 2mm and not more than 6mm. Normally Slow Setting Emulsion is used for slurry seal.

Cold Mix

It is a mixture of mineral aggregates, and Bitumen Emulsion is used for general surfacing or open graded premix carpet, road repairs and maintenance, damage road surfaces or potholes, restoring excavated surface etc.

Tack Coat

It is a light spray of Bitumen Emulsion for ensuring a good bond between an old and a new bituminous surface layer. It should be applied very thin and must cover the entire surface evenly. Normally Rapid Setting Emulsion is used for Tack Coat.

Prime Coat

It is used for preparing a granular road base for bituminous surfacing. Depending upon the properties of the road base; Slow Setting or Medium Setting Emulsion can be used for Prime Coat.

Fog Seal / Crack Seal

It is used to renew old bituminous surface suffering from oxidation, drying, cracks or surface voids. The Emulsion flows easily into the cracks and surface voids and prolongs the lifetime of the bituminous surface. Normally Medium Setting and Slow Setting Emulsion are used for Fog Seal.

Soil Stabilization

It is used for upgrading marginal aggregates or increasing load bearing capacity and firmness of road base. Aggregates and Bitumen Emulsion are mixed while in a self-propelled plant when moving along the road. It leaves a uniform, properly coated mix on the road surface, which is then compacted. Normally Medium Setting and Slow Setting Emulsion are used.

Surface Dressing

It is simple and inexpensive road surface treatment. With proper drainage, maintenance and resurfacing, surface dressed road can last for a long time. Bitumen Emulsion is sprayed on the road surface followed by an aggregate cover and finished by rolling immediately. Road can be opened for slow traffic in less than thirty minutes. Normally Rapid Setting Emulsion is used for Surface Dressing.

Penetration Macadam

It is a base construction of compacted rock, which is sprayed over with Bitumen Emulsion. Bituminous Premix or surface designs are used as wearing course on Penetration Macadam. Normally Rapid Setting Emulsion is used for Penetration Macadam.

Potholes Repair

It is a mixture of special graded aggregates with specially formulated modified emulsion to fill the Potholes instantly at any weather conditions except during heavy rainfall.

INTRODUCTION

JS BITUMEN is one of the largest manufacturer & supplier of Road Emulsion, Blown Grade Bitumen, Tarfelt & all its by-products having latest technology, well equipped laboratory and highly experienced manpower situated at Bagnan on Kolkata – Mumbai National Highway 6 – a short distance from Kolkata & Kolkata port for easily marketing and export – import facility for business.

Demand for Road Emulsion and all its Bitumen by-products in India are progressively increasing over the years. So for making India, it is necessary to connect India by road corridors.

Our manufacturing capacity per month is more than 3000 M.T. and would increase day by day for good quality & our behaviours.

OUR OTHER PRODUCTS

1. All grade blown Bitumen is 90/15, 85/25, 115/15, 135/10 (IS : 702 - 1988)
2. Sealing Compound for sealing joints (Roof. Bridge Platform, Roads)
3. Water Proofing Compounds for Leak Proof, Asbestos Roof, Buildings, Train & Bus Roof.
4. Black Japan IS 158 / 68, this is an Anti – Corrosive cold applied Bituminous Paints.
5. Crumb rubber modified Bitumen (IRC SP – 53 – 2010)
6. Polymer Modified Bitumen (IRC SP – 53 – 2010)
7. JS Bitumen Cold Mix (IRC – 100 -2014)
8. Mastic Bitumen- 10/20, 20/30, 30/40
9. Polymer Modified Emulsion - ASTM D 6372 - 15
10. Potholes Repair

REQUIREMENTS FOR CATIONIC EMULSIFIED ASPHALT

ASTM D 2397 : 2002

Test	Rapid-Setting				Mediam-Setting				Slow-Setting				Quick Setting	
Grade	CRS-1		CRS-2		CMS-2		CMS-2H		CSS-1		CSS-1H		CQS-1H	
	min	max	min	max	min	max	max	min	min	max	max	max	min	max
Viscosity, Saybolt Furol at 25°C (77°F) SFS	—	—	—	—	—	—	—	—	20	100	200	100	20	100
Viscosity, Saybolt Furol at 50°C (122°F) SFS	20	100	100	400	50	450	50	450	—	—	—	—	—	—
Storage stability test, 24-h, %[A]	—	1	—	1	—	1	—	1	—	1	—	1	—	—
Demulsiblity, 35 mL, 0.8 % dioctyl sodium	40	—	40	—	—	—	—	—	—	—	—	—	—	—
sulfosuccinate, %	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Coatng ability and water resistance :	—	—	—	—	good	—	good	—	—	—	—	—	—	—
Coating, dry aggregate	—	—	—	—	Fair	—	Fair	—	—	—	—	—	—	—
Coating, wet aggregate	—	—	—	—	Fair	—	Fair	—	—	—	—	—	—	—
Coating, after spraying	—	—	—	—	Fair	—	Fair	—	—	—	—	—	—	—
Particle charge test	Postive	—	Postive	—	Postive	—	Postive	—	Postive	—	Postive	—	Postive	—
Sieye test %[A]	—	0.10	—	0.10	—	0.10	—	0.10	—	0.10	—	0.10	—	0.10
Cement mixing test %	—	—	—	—	—	—	—	—	—	2.0	—	2.0	—	N/A
Distillation :	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Oil distillate, by volume of emusion, %	—	3	—	3	—	12	—	12	—	—	—	—	—	—
Residue, %	60	—	65	—	65	—	65	—	57	—	57	—	57	—
Test on residue from distillation test :	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Penetration, 25°C (77°F), 100 g.5s	100	250	100	250	100	250	40	90	100	250	40	250	250	250
Ductility, 25°C (77°F), 5 cm/min, cm	40	—	40	—	40	—	40	—	40	—	40	—	40	—
Solublity in trichloroethylene, %	97.5	—	97.5	—	97.5	—	97.5	—	97.5	—	97.5	—	97.5	—

Specification of

CATIONIC BITUMEN EMULSION

Colour Bitumen Emulsion
JS Bitumen-Tarfelt Industries Pvt. Ltd.

	Test	Requirements As per IS : 8887-2017				
		RS1	Rs2	MS	SS1	SS2
1	Residue on 600 micron IS sieve, % mass, MAX	0.05	0.05	0.05	0.05	0.05
2	Viscosity by Saybolt Furol Viscometer, sec, at 25°C	-	-	-	20-100	30-150
3	Viscosity by Saybolt Furol Viscometer, sec, at 50°C	20-100	100.-300	50-300	-	-
4	Coagulation of Emulasion at low temperature	NIL	NIL	NIL	NIL	NIL
5	Storage stabilitiy after 24 hours, % MAX\	2	1	1	2	2
6	Particle charge	+ve	+ve	+ve		+ve
7	Coating ability and water resistance					
7a	Dry aggregates	-	-	Good	-	-
7b	After spraying	—	-	Fair	-	-
7c	Wet aggregates	—	-	Fair	-	-
7d	After spraying	—	-	Fair	-	-
8	Stability to mixing with cement % coagulation, MAX	—	-	-	-	2
9	Miscibility with water	No Congratulation			Immiscible to be allowed	
10	Tests on Residue					
10a	Residue by evaporation, %, MIN	60	67	65		60
10b	penetration at 25°C, 100g, 5 sec	80-150	80-150	60-150		60-120
10c	Ductility at 27°C, cm, MIN	50	50	50		50
10d	Solubility in Trin-chloro-ethyleen, % MIN	98	98	98	98	98
11	Distillation in % by volume, MIN					
a	190°C	-	-	-	20-55	-
b	225°C	-	-	-	30-75	-
v	260°C	-	-	-	40-90	-
d	315°C\	-	-	-	60-100	-
12	Water content, % by mass, MAX	-	-	-	20	-
13	Residue at 360°C% MINI				50	

SINGLE COAT SURFACE DRESSING WITH CATIONIC BITUMEN EMULSION

As per IRC :100 and MoRTH guidlines, Cationic Bitmen Emulsion can be used for the following,
1) Surfacing for low volume roads,
2) Renewal Coat and
3) Temporary Surfacing

Binder

The binder specified for these application is Cationic Bitumen Emulsion, Rapid Setting 2 grade complying with IS:8887 2004.

Preparation of Surface

The existing base on which surface dressing is to be laid, should be prepared and corre-cted to a uniform grade and camber. All depressions and potholes should be filled up and compacted sufficientially. The surface should be cleaned to remove all loose particl-es, dust and foreign matter. If possible water should be sprayed to wash away losses dust and to expose a clean surface of aggregates (in case of granular base courses).

If the base on which surface dressing is to be laid an old bituminous surface, it should be swept clean and made free of sand, dust and other loose matter by means of wire, coirb-rushes, small picks or brooms etc.

For primed surface dressing should not be laid until the prime coat has throughly curved. The edges of the surface to be corrected stretched rope lines.

Precaution before application

The Cationic Bitumen Emulsion should be sprayed uniformly on the prepared base by a mechanical sprayer or cams. While using spray cans, the holes should be of 6 mm diameter spaced at 30 mm apart to prevent clogging.

Rate of application

1. For granular base with aggregates of 13.2 mm (4.14 to. 15/M3/M2) quantity.Should be 2.5 to 3.0 Kgs/M^2
2. For subsequent or renewal coat with aggregates 11.2 mm (0.09 to 0.11/M3/2) the emulsion quantity should be 1.2 to 1.4 Kgs/M^2

Application of Aggregates

Immediatly after spraying of emulsion, appropriate size aggregates should be spread at the given rate uniformly covering the surface completely and evenly, followed by rolling.

TOW -COAT SURFACE DRESSING WITH CATIONIC BITUMEN EMULSION

As per IRC: 96 and MoRTH guidelines, Cationic Bitumen Emulsion can be used for tow -coat surface dressing as follows.

Binder

The binder specified for this application is Cationic Bitumen Emulsion Rapid setting 2 grade complying with IS :8887 2004.

Preparation of Surface

The existing base on which surface dressing is to be laid. Should be prepared shaped and corrected to a uniform grade and camber, All desperation and potholes should be filled up and compacted sufficiently. The surface should be cleaned to remove all loose particles, dust and foreign matter. If possible water should be sprayed to wash away loose dust and to expose a clean surface aggregates (in case of granular base courses)

Precaution before application

The Cationic Bitumen Emulsion drums should be rolled 5 to 6 times, to and fro, at slow speed, for a distance of about 10 meters mix the contents properly.

First Coat

Application of Binder

The Cationic Bitumen Emulation should be sprayed uniformly on the prepared base by a mechanical sprayed or cans. While using spray cans. The holes should be of 6 mm dia- meter spaced at 30 mm apart to prevent clogging.

Rate of Application

For the first coat, rate of application of emulsion should be 1.2 to 1.4 kgs/M2. Application of Aggregates Immediately after spraying of emulsion, 13.2 Aggregate should be spread uniformly covering the surface completely and evenly, followed by rolling.

Second Coat

Second coat of surface dressing may be applied on the same day as the first coat. How- ever, the second coat should be before one hour after the rolling of the first coat. Traffic should not be allowed on the first coat before application of the second coat.

Application of Binder

The aggregates of the first coat may appear loose and unbounded at a few places. How- ever, these should not be disturbed because the same will get bonded after breaking or setting of emulsion, The Cationinc Bitumen Emulsion should be sprayed uniformly on the prepared base by a mechanical sprayer or spraying cans.

Rate of Application

For the second coat, rate of application of emulsion should be 1.6 to 1.8 Kgs./M2

Application of Aggregates

Immediately after spraying of emulsion, 6,7mm aggregate should be spread uniformly covering the surface compelet;y and evenly. Followed by rolling.

OPEN GRADE PREMIX CARPET WITH CATIONIC BITUMEN EMULSION

Asper IRC : 14 and MoRTH guidline, Cationic Bitumen Emulsion can be for open graded premix carpet as follows.

Binder
The blinder specified for this application is Cationic Bitumen Emulsion Rapid setting 1 for tack coat, medium setting grade for premix carpet and Slow setting grate for premix seal coat complying with IS :8887 2004. For liquid seal coat Medium setting grade may be used but use Rapid setting grade is preferable.

Preparation of Surface
The existing base which surface dressing is to be laid, should be prepared, shaped and corrected to a uniform great and camber, All depressions and patholes should be filled up and compacted sufficiently. The surface should be cleaned to remove all loose parti-cles, dust and foreign matter. If possible water should be sprayed to wash away loose dust and to expose a clean surface of aggregates (in case of granular base courses).

Precaution before application
The Cationic Bitumen Emulsion drums should be rolled 5 to 6 times, to and fro, at slow speed, for a distance of about 10 meters mix the contents properly.

Application of Binder (Tack coat)
The Cationic Bitumen Emulation should be sprayed uniformly on the prepared base by a mechanical sprayed or cans. While using spray cans. The holes should be of 6 mm diameter spaced at 30 mm apart to prevent clogging. The range for spraying tempera-ture for emulsion should be 20 to 70 C. The tack cost should be left to cure till all volatil-es have evaporated. On water Bound Macadam surface, water should be sprayed before applying tack coat.

The rate application of emulsion for carious surface should be as under,

Normal Bitumen Surface (Existing black top)	0.20 to 0.30 Kgs/M^2
Dry and hungry Bitumen surface	0.25 to 0.35 Kgs/M^2
Granular surface treated with primer	0.25 to 0.30 Kgs/M^2
Granular surface (non-primed)	0.35 to 0.40 Kgs/M^2
Cement Concrete surface	0.25 to 0.40 Kgs/M^2

20 mm Premix Carpet

Preparation of Premix
Premixing of Cationic Bitumen Emulsion and aggregates may be done in a cold mixing plant or in a concrete mixer. For large works, continuous mixing may be done in batch or continuous mix plant.
After thorough mixing the premix is transported to the laying site by suitable means. Too much mixing should be avoided. After 1 Minutes of applying tack coat, the premix should be spread uniformly to the desired thickness followed rolling.

Rate of Application of Binder
For 20mm premix carpet, the emulsion should be used at the rate of 2.0 to 2.3 Kgs/M^2

SEAL COAT WITH CATIONIC BITUMEN EMULSION

Seal Coat
A seal coat (Liquid seal coat or premix seal coat) should be applied 4 to 6 hours after lying the premix carpet. The emulsion should be used at the rate of 1.2 to 1.4 Kgs/M^2.

Liquid Seal Coat
The Cationic Bitumen Emulsion should be sprayed uniformly on the prepared base by a mechanical sprayer or cans. While using spray cans. The holes should be of 6 mm dia-meter spaced at 30mm apart to prevent clogging.

Application Of Binder
The Cartionic Bitumen Emulsion should be sprayed uniformly on the prepared base by a mechanical sprayer or cans. While using spray cans. The holes should be of 6 mm diameter so as special at 30mm apart to prevent clogging.

Application of aggregates
Immediately after spraying emulsion, stone chips in a clean state should be applied uniformly so as to cover the surface completely followed by rolling.

Rate of Application of aggregates
For liquid seal coat crushing fine aggregates of 6.7mm should be done in a cold making 0.006 cu.m. / M^2.

Premix Seal Coat
Cationic Bitumen Emulsion (Slow setting) should be used.

Preparation of Premix
Premixing of Cationic Bitumen Emulsion and grit or send may be done in a cold mixing plant or in a concrete mixer. For large works, continuous mixing may be done in batch or continuous mix plant.

After through mixing the premix is transported to the lying site by suitable means. Too much mixing should be avoided.

Rate of Application of Binder
For premix seal coat, the emulsion should be used at rate of 1.0 to 1.2 kgs/M^2.

USER'S GUIDE

REQUIREMENTS FOR PAVING BITUMEN

	Characteristics	Requirements As per IS 73 : 2013				Method of Test Ref to
		VG10	VG20	VG30	VG40	
1	Prenetration at 25^{0}C, 100 g, 5s, 0.1 mm, Min	80	60	45	35	IS 1203
2	Assolute viscosite at 60^{0}C, Poises	800-1200	1600-2400	2400-3600	3200-4800	IS 1206 (Part-2)
3	Kinematic viscosity at 135^{0}C cSt, Min	250	300	350	400	IS 1206 (Part-3)
4	Flash point (Cleveland open cup), ^{0}C, Min	220	220	220	220	IS 1448 (P:69)
5	Softening point (R & B), ^{0}C, Max	40	45	47	50	IS 1205
6	Solubility in trichaloroethylene, % Min	90	90	90	90	IS 1216
7	Viscosite ratio at 60^{0}C, cm, Min	4.0	4.0	4.0	4.0	IS 1206 (Part-2)
8	Ductility at 25^{0}C, cm, Min	75	50	40	25	IS 1208

DIFFERNT USES OF CATIONIC BITUMEN

- **Emulsion on Road by different ways**
  - Tack Coat
  - Prime Coat
  - Seal coat
  - Fog seal/crack seal
  - Chip seal
  - Slurry seal
  - Cold mixes
  - Micro Surfacing
  - Tack Coat
  - Patch work

Advantages of JS Bitumen Emulsions

Application of JS Bitumen Emulsion in road work has the following unique advantages of over the convential hot Bitumen application.

- **ENVIRONMENT FRIENDLY**
  - NO hydrocarbon fumes
  - Arrests Dust Pollution
  - Helps maintain Ecological balance
- **ECONOMICAL**
  - Time and labor saving
  - No Wastage of Binder
  - Reuse of drums
  - Extended working periods
  - Can be used with water
- **ENERGY SAVING**
  - No heating
  - Saves National resources
- **DURABILITY**
  - Anti stripping property of emulsifier
  - Bonding characteristics of Bitumen remain intact
- **SAFE AND EASY HANDLING**
  - Applied cold N
  - No handling risk
  - Non-hazardous and non-toxic
  - Emulsion can be used in wet weather
- **SIMPLE APPLICATIOM**
  - No complicated machinery fox mix preparation
  - Temperature independent spraying

- JS BITUMEN RS-1
- JS BITUMEN MS
- JS BITUMEN SS-1
- JS BITUMEN SS-2
- JS BITUMEN CSS-1
- JS BITUMEN CSS-1H
- JS BITUMEN CQS-1H
- JS BITUMEN Cold Mix