Green Star

Producer of Different Types of Bitumen Emulsion


Green Star

ABOUT US

GREEN STAR INDUSTRIES SDN. BHD. is a General Trading company established in Malaysia. This company has over 30 years of experience in supplying many products for its clients all over the world, especially the products related to road and building constructions, such as different kinds of paving grade bitumen and bitumen emulsion. This company has played its roles as the supplier of many important asphalt paving projects in different countries like Turkey, Armenia, Azerbaijan, Georgia, Turkmenistan, Iran, Oman, Malaysia and Vietnam.

In this catalog, we want to focus on BITUMEN EMULSION, its specifications and applications that Green Star provides.

GREEN STAR VISION

Providing and delivering different kinds of oil derivatives, particularly paving grade bitumen and bitumen emulsion with the best quality due to reducing environmental damage and making loyal customers around the world.

GREEN STAR MISSION

Supplying bitumen emulsion, paving grade bitumen and cold mix asphalt in accordance with international Standards and delivering them to the customers in the agreed time.

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GUIDE LINE

1-Substitution making in organization

2-Providing a win-win situation with customers and key partners

3-Continuous improving in technical knowledge, management and trading

4-24-7 supplying and delivering products

5-Improving the customers' and key partners' satisfaction

6- Market development and branch increase in and out of Malaysia

ORGANIZATIONAL VALUE

1-Helping to save oil and protecting environment

2-Fast delivery and friendly communication with customers

3-Production discipline and sales creativity

4-Playing role for reducing road dangers

5-Providing high quality products according to the customer needs

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CHARACTARISTICS OF OUR COMPANY

1. Capability of supplying different types of bitumen for the needs of road and building construction worldwide.

2. Delivering products to all countries within 45 days.

3. Supplying goods comprising with the best raw material, which results in conformity with different National and International Standards (EN: 13808, ASTM D2397, EN: 12591, ASTM D946, AASHTO M208, IS 8887) .

4. Possessing bitumen standard laboratory equipment which yields to have satisfied customers

5. Assurance of goods quality, for instance, 4-month guarantee for bitumen emulsion and 1 year guarantee for paving grade bitumen.

BITUMEN EMULSION

Since 1951, Cationic Bitumen Emulsion, has been used in different countries like Britain, Germany, Denmark, Austria and India.The Strategy of protecting the environment and the technical-economical notices resulted in replacing cutback bitumen with bitumen emulsion, especially in road constructions.Bitumen emulsion is a mixture of primary paving grade bitumen (40-50, 60-70, 85-100, 100-150, 150-200 and 200-300 grades) with water, emulsifier, acid and stabilizer ingredients. It is a water-based substance in which the emulsifier keeps bitumen and water mixed together and won't let them to be separated. In terms of electrical charge, we have three kinds of bitumen emulsion: 1- Cationic with positive charged particles 2- Anionic with negative charged particles 3- Amphoter or non-ionic with neutral charged particles. Since 1951, cationic bitumen emulsion has been being used for 90% of applications in which bitumen has positive charges. Positive ions surrounding bitumen particles stick to aggregates where oppositely charged ions are attracted to each other, cationic bitumen emulsion with positive charged particles and aggregates with negative charged particles. The start of interaction between bitumen emulsion and aggregates is called Breaking or Setting. By breaking, water comes apart and the primary bitumen used as raw material will remain in combination with aggregates.

Common paving grade bitumen as emulsion's raw material is 60-70 and 85-100. the penetration of the residual bitumen after distillation of bitumen emulsion (in 25 centigrade temperature, 100 grams, 5 seconds) would be between 60 to 200 usually. The colder the weather of the ambient is, the lower viscosity paving grade bitumen will be used in producing bitumen emulsion. The percentage of paving grade bitumen in a Metric Ton of bitumen emulsion is 40 to 69. This percentage depends on the application that customer needs to use the bitumen emulsion. For example, for water proofing applications, usually 40% or 65% of bitumen emulsion should be primary paving grade bitumen. For spray applications, 40% to 65% of bitumen emulsion should be primary paving grade bitumen and for surface dressing applications, 65% to 69% of bitumen emulsion should be primary paving grade bitumen. We can produce any types of bitumen emulsion with any specifialcations that customer needs.

TYPES OF BITUMEN EMULSION

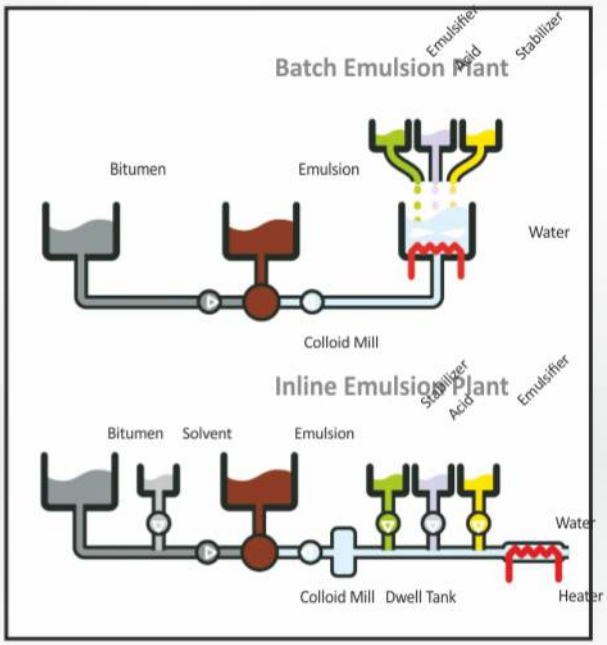
Bitumen emulsion varies by its particle charge, breaking speed, primary paving grade bitumen type and water percentage according to its different applications. We have stated about particle charge, paving grade bitumen type and water percentage, now we want to talk about breaking speed. Mainly, emulsifier used as raw material makes bitumen emulsion with different breaking speeds and base on this, it is divided to four main types as below:

CRS: Cationic Rapid Setting comprising of 40% to 69% paving grade bitumen that breaks completely in 0.5 to 2 hours.

CMS: Cationic Medium Setting comprising of 55% to 65% paving grade bitumen that breaks completely in 2 to 5 hours.

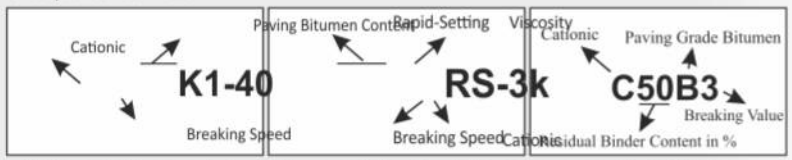
CSS: Cationic Slow Setting comprising of 55% to 65% paving grade bitumen that breaks completely in 4 to 15 hours.

CQS: Cationic Quick Setting comprising of 40% to 65% paving grade bitumen that breaks completely in 10 to 30 hours.



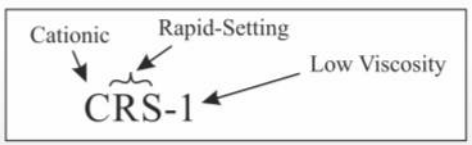
BITUMEN EMULSION NOMENCLATURE:

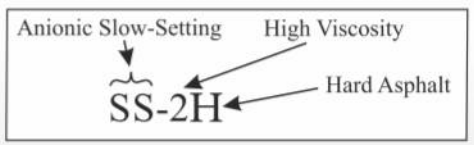
Bitumen emulsion nomenclature in British, Malaysian and European standard is depicted as follow:



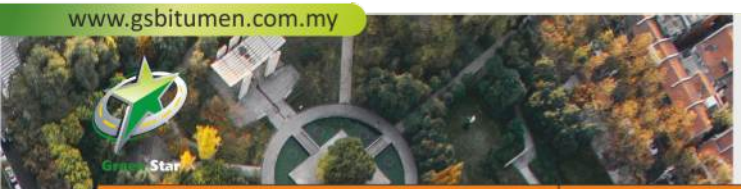
In British and Malaysian standard, "K" means "Cationic", which in European standard, "C" letter means "Cationic". In British standard, the one-digit number ("1") means "Breaking Speed", the more, the slower it breaks. In Malaysian standard, the one-digit number ("3") means the viscosity and somehow coordinated proportion of primary paving grade bitumen in bitumen emulsion; For instance, RS-1K means Rapid Setting bitumen emulsion with 50% of paving grade bitumen and viscosity of between 15-70 seconds, if it is "2", it shows 60% paving grade bitumen and 20-100 second viscosity, and if it is 3, that means 65% paving grade bitumem with 20-100 second viscosity. In European standard, one-digit number("3") means breaking value, the more it is, the slower the breaking speed will be. "RS" in Malaysia standard means "Rapid-Setting" and "SS" means "Slow-Setting". In European standard, "B" means "Paving Grade Bitumen" used as bitumen emulsion raw material. The two-digit number in both British and European nomenclature shows "Residual Binder (Paving Grade Bitumen) Content %".

Bitumen emulsion nomenclature in American standard (ASTM) is depicted as follow:





In American nomenclature In which "C" means "Cationic" and if there is no "C" in the name, that means the bitumen emulsion is "Anionic", the middle letter "R", "M" or "S" shows the breaking speed, "Rapid", "Medium" and "Slow", respectively. The last letter before the dash ("-") means "set". The number in the name shows the viscosity, "1" means low viscosity (between 20 to 100 seconds) and "2" means high one (between 100 to 400 seconds).



Test	Document (test method)	K1-40/RS-0K C40B3	RS-1K/C50B3	C55B3	CRS-1(H)/K1-60/ RS-2K/C60B3	CRS-1(H)/ RS-3K/C65B3
Binder content Bitumen residue (%)	EN 1428 - EN 1431 — ASTM D6997	38 - 42	48 - 52	53 - 57	58 - 62	63 - 67
Breaking value (none)	EN 13075-1	70 - 155	70 - 155	70 - 155	70 - 155	70 - 155
Fines mixing time (s)	EN 13075-2 — ASTM D6935	-	-	-	-	-
Sieve test (%)	EN 1429 — ASTM D6933	0.1 ≥	0.1 ≥	0.1 ≥	0.1 ≥	0.1 ≥
Viscosity Saybolt Furel at 25°c (s)	EN12846-1 — ASTM D7496	0-25	15-70	15-70	-	-
Viscosity Saybolt Furel at 50°c (s)	EN12846-1 — ASTM D7496	-	-	-	20-100	20-100
Storage stability 24-h (%)	EN1429 — ASTM D6930	1 ≥	1 ≥	1 ≥	1 ≥	1 ≥
Particle charge (none)	ASTM D244 — ASTM D7402	Positive	Positive	Positive	Positive	Positive
(Coating ability and water Resistance) Coating, dry aggregate	ASTM D244	-	-	-	-	-
(Coating ability and water Resistance) Coating, after spraying water	ASTM D244	-	-	-	-	-
(Coating ability and water Resistance) Coating, wet aggregate	ASTM D244	-	-	-	-	-
(Coating ability and water Resistance) Coating, after spraying water	ASTM D244	-	-	-	-	-
Cement Mixing (%)	EN 12848—ASTM D6935	-	-	-	-	-
Demulsibility, 35 ml. 0.8% Dioctyl Sodium Sulfosuccinate (%)	ASTM D6936	≥ 40	≥ 40	≥ 40	≥ 40	≥ 40
Oil distillate content %	EN 1431 — ASTM D6997	3 ≥	3 ≥	3 ≥	3 ≥	3 ≥
Tests on residue from distillation/evaporation test						
Penetration, 25°c,100 gr on 5 sec(0.1mm)	EN1426 — ASTM D5	≥ 60 & 200 ≥	≥ 60 & 200 ≥	≥ 60 & 200 ≥	≥ 60 & 200 ≥	≥ 60 & 200 ≥
Ductility, 25°c , 5cm/min (cm)	ASTM D113	≥ 40	≥ 40	≥ 40	≥ 40	≥ 40
Solubility in trichloroethylene (%)	ASTM D2042	≥ 97.5	≥ 97.5	≥ 97.5	≥ 97.5	≥ 97.5
Softening Point (°C)	EN 1427 — ASTM D36	≥ 46	≥ 46	≥ 46	≥ 46	≥ 46

Test	Document (test method)	CMS-1(H)/ MS-1K/C60B4	CMS-2(H)/ MS-2K/C65B5	CSS-1(H)/K3/ SS-1K/C55B6	CSS-1(H)/ C65B6	CQS-1(H)
Binder content Bitumen residue (%)	EN 1428 - EN 1431 — ASTM D6997	58 - 62	63 - 67	54 - 58	63 - 67	57 - 63
Breaking value (none)	EN 13075-1	110 - 195	≥ 170	-	-	-
Fines mixing time (s)	EN 13075-2 — ASTM D6935	-	-	≥ 90	≥ 90	-
Sieve test (%)	EN 1429 — ASTM D6933	0.1 ≥	0.1 ≥	0.1 ≥	0.1 ≥	0.1 ≥
Viscosity Saybolt Furel at 25°c (s)	EN12846-1 — ASTM D7496	-	-	15-70	20-100	20-100
Viscosity Saybolt Furel at 50°c (s)	EN12846-1 — ASTM D7496	20-100	50-450	-	-	-
Storage stability 24-h (%)	EN1429 — ASTM D6930	1 ≥	1 ≥	1 ≥	1 ≥	1 ≥
Particle charge (none)	ASTM D244 — ASTM D7402	Positive	Positive	Positive	Positive	Positive
(Coating ability and water Resistance) Coating, dry aggregate	ASTM D244	Good	Good		-	-
(Coating ability and water Resistance) Coating, after spraying water	ASTM D244	Fair	Fair		-	-
(Coating ability and water Resistance) Coating, wet aggregate	ASTM D244	Fair	Fair		-	-
(Coating ability and water Resistance) Coating, after spraying water	ASTM D244	Fair	Fair		-	-
Cement Mixing (%)	EN 12848—ASTM D6935	-	-	2 ≥	2 ≥	-
Demulsibility, 35 ml. 0.8% Dioctyl Sodium Sulfosuccinate (%)	ASTM D6936	≥ 40	≥ 40	≥ 40	≥ 40	≥ 40
Oil distillate content %	EN 1431 — ASTM D6997	12 ≥	12 ≥	8 ≥	8 ≥	5 ≥
Tests on residue from distillation/evaporation test						
Penetration, 25°c,100 gr on 5 sec(0.1mm)	EN1426 — ASTM D5	≥ 60 & 200 ≥	≥ 60 & 200 ≥	≥ 60 & 200 ≥	≥ 60 & 200 ≥	≥ 60 & 200 ≥
Ductility, 25°c , 5cm/min (cm)	ASTM D113	≥ 40	≥ 40	≥ 40	≥ 40	≥ 40
Solubility in trichloroethylene (%)	ASTM D2042	≥ 97.5	≥ 97.5	≥ 97.5	≥ 97.5	≥ 97.5
Softening Point (°C)	EN 1427 — ASTM D36	≥ 46	≥ 46	≥ 46	≥ 46	≥ 46

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BITUMEN EMULSION APPLICATIONS

Applications	Cationic			
	CRS	CMS	CSS	CQS
Water Proofing	●		●	
Prime Coat	●		●	
Seal Coat	●			
Tack Coat	●	●	●	●
Fog Seal	●		●	●
Chip Seal	●			
Slurry Seal			●	●
Sand Seal	●		●	
Micro Surfacing			●	●
Cold Mix		●	●	
Soil Stabilization/ Mulching		●	●	

BITUMEN EMULSION SPECIFICATIONS

- Possibility of long distance transportation in bulk packing or in drums
- Possibility of asphalt and Seal Coat applications with low thickness
- High speed of asphalt paving and coatings
- Suitable for any kinds of asphalt and maintenance (Streets- Roads- Airport)
- Not flammable while keeping, transferring and implementation
- Capability of implementing in ambient temperature
- High penetration rate due to high fluidity
- Can be applied by simple spraying machines with narrower nozzles than the nozzles for spraying cutback bitumen
- Completely adapts to the environment in the whole process of producing, transportation, spraying, paving and breaking
- Fast breaking when facing with stone materials (about 0.5 to 15 hours according to the bitumen emulsion breaking type)
- Not toxicant without aroma
- No need of heating when the temperature is above 5 centigrade
- Capability of being used on wet surfaces
- Changing color from brown to black after spraying on the surface
- Avoiding separation of bitumen and water due to cold weather, bitumen emulsion must be kept at temp. between 5 to 60 centigrade; however, if indirect heating (like oil heating system) is not accessible, we can mix it with a vertical mixer, or we can circulate it, once in a week.
- Should be pumped at the bottom of the storage tank (and not from the top) so that water and primary bitumen remain intermixed
- Installing spraying nozzles at the right place for achieving the best application (at least two nozzles are required to cover any part of the surface)
- Driving asphalt paver or truck on the sprayed surface after 30 min. to 15 hours (according to the used bitumen emulsion's breaking speed) without worry of sticking to their tires
- 4-month storage stability and having capability of adding one month to the bitumen emulsion lifetime by mixing with a mixer once in a week

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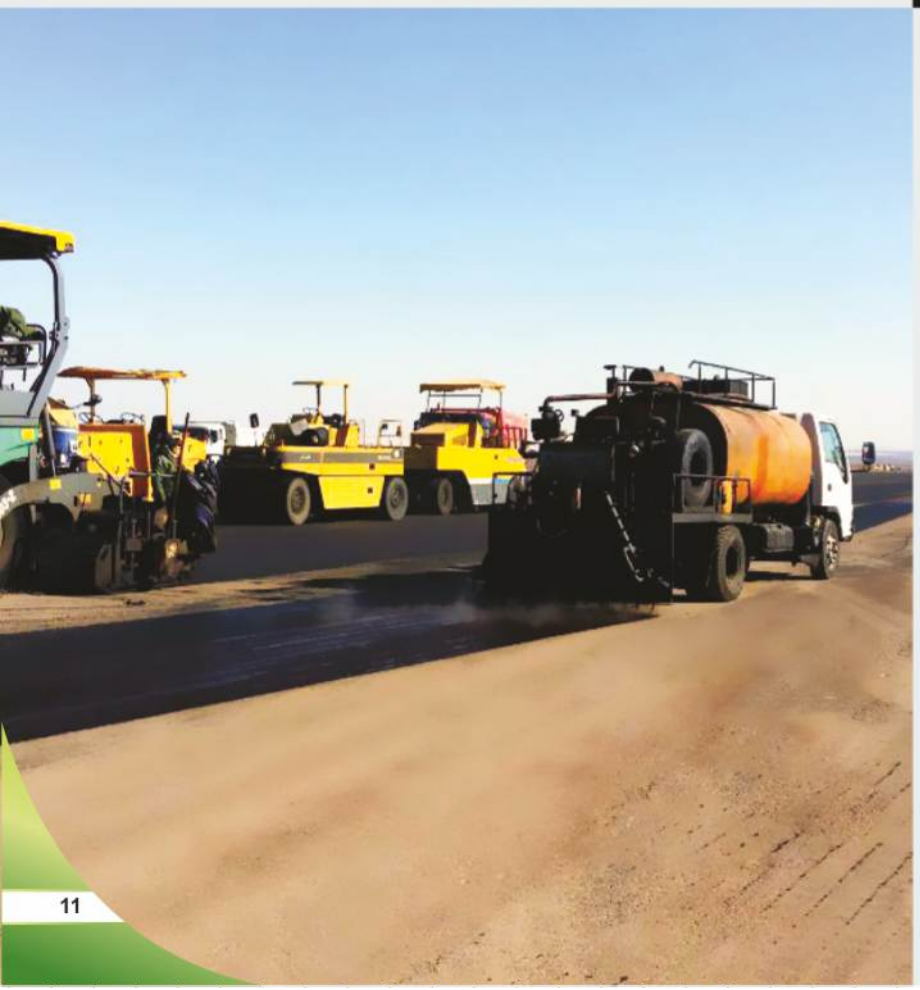
WATER PROOFING

For water proofing purposes, the bitumen emulsion can simply be sprayed on the considering surface such as wall, roof, floor, pool, rest room and etc. and no heating is needed. You just need to disperse it with a sweeper or sprayer and after 30 minutes, it will break while cutback bitumen will break for at least a day.



PRIME COAT

Spraying a layer of bitumen emulsion on the base layer making the base layer water proof and preparing the base layer for performing another asphalt layer on it. CRS or CSS type of bitumen emulsion is used for this application.

Prime Coat Applications and Facts:

1-It penetrates to the base layer. It acts like a glue to the material of the base and binds them to each other.

2-It makes the base layer hard and tough. It also makes the base layer water proof and acts as a seal by filling the voids and cavities.

3-It sticks base layer and asphalt layer implemented on it.

4- 0.9 to 1.5 kilograms of bitumen emulsion is enough to apply on a square meter whereas cutbacks should be sprayed 1.2 to 1.8 kilograms on a square meter.

5-If the road has water hole or is a water saturated surface, prime coat must not be applied until water is removed.

6-It is better to spray a water layer on the base surface for better penetration.

7-After 2 to 15 hours, the first asphalt layer could be applied on the base layer.

8-The application has low cost.

SEAL COAT

Spraying bitumen emulsion on the old asphalt layer and adding one layer of aggregates on it. Normally CRS and CSS type is used for this purpose.

Seal Coat Applications and Facts:

1-It makes asphalt layer smooth, safe, steady, water proof and stops being slippery.

2-It creates color contrast between main road and shoulder of the road.

3-Seal coat provides more tolerance for the top layer so that the layer bears indent and ice pick tires more.

4-Seal coat lifetime is between 3 to 5 years and it is better to be applied on a warm day.

5-Seal coat is cheaper than keeping and maintaining a deteriorated asphalt layer.

6-Applying bitumen emulsion as seal coat is more economical than cutback bitumen.

7-Seal coating is also suitable for the roads which we have not decided to rehabilitate yet.

TACK COAT

Spraying bitumen emulsion between the asphalt layer below the top asphalt layer and the top one which results to stick two layers and avoids slipping on each other, as well as water proofing the surface. CRS, CMS, CSS or CQS type of bitumen emulsion are used for this application (usually CRS has been being used).

Tack Coat Application and Facts:

1-This application is necessary to stick two asphalt layers together.

2-It prevents the layers from slipping on each other.

3-Only 300 to 800 grams of bitumen emulsion is needed on a square meter.

4-By applying tack coat, two layers act as one result in terms of consistency and stability.

5-It is cost efficient with respect to the other approaches.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FOG SEAL

Just spraying a CRS, CSS or CQS bitumen emulsion on the top asphalt surface.

Fog Seal Applications and Facts:

1-It rejuvenates dry and old asphalt surface.

2-It caulks the crevices and fills voids of the asphalt layer.

3-It prevents the surface from raveling (usually used for open graded mixtures).

4-It stabilizes shoulders of the road.

5-The drier surface of the road is, the later Fog Seal can be applied(once in 6 months up to 1 year).

6-The surface which the Fog Seal is going to be applied should have voids and porosities so as to stabilize the bitumen emulsion in it. Moreover, the surface must be clean without dust and oil on it.

7-30 minutes up to 2 hours is the time needed for bitumen emulsion to break completely and traffic should move slowly on it at the first hours.

8-Fog Seal's life time is 2 years and it is very cost effective.

CHIP SEAL

Spraying a layer of CRS bitumen emulsion and a layer of aggregates on it. In case the road is busy or there is a high traffic street, we can implement an asphalt layer or one or two Slurry Seal layers or one or two Micro surfacing layers after applying Chip Seal.

Chip Seal Applications and Facts:

1-After applying Chip Seal, we can implement Slurry Seal or Micro surfacing to fill the voids between aggregates and to have a black and monotonous surface.

2-It prevents bitumen emulsion from freezing which is under and over its layer.

3-It improves surface texture, waterproofs the surface and protects the underlying pavement from oxidation, fatigue,aging as well as traffic wear.

4-It gives new life to dry and weathered surfaces and seals small cracks and imperfections.

5-It is an economic way to resurface roads.

6-Size of aggregates must be 6 to 12 mm.

SLURRY SEAL

A mixture of aggregates, water, CSS or CQS bitumen emulsion and filler (usually cement) that should be paved with special Slurry Seal paving machine. Slurry seal not only fills the voids, but also it helps the surface to be more resistant.

Slurry Seal Applications and Facts:

1- It fills the surface voids.

2- It prevents coarse and crack problems of the surface.

3- It fills the small cracks.

4- It improves fractures of the surface.

5- It improves the surfaces facing oxidation and coarse problems.

6- The applying surface must be cleaned by a sweeper or blower machine without dust.

7- If the surface has fast growing cracks or big holes or the surface is completely damaged, we should not use this application.

8- Thickness of this Sealing is about 3 to 10 millimeters dependent on the place condition and after about 2 hours, traffic can pass on it.

9- It is better to apply Slurry Seal when the road surface temperature is at least 10 centigrade and there isn't any risk of freezing within the first 24 hours after implementation.

10- Slurry Seal's life time is 3 to 5 years. Fast paving process, usage of less aggregates, high resistance to fracture, preventing height difference between road surface and shoulder of the road as well as notable cost reduction are other main advantages of this application.

SAND SEAL

Applying a CRS or CSS bitumen emulsion layer with fine aggregates or clean and washed sand.

Sand Seal Applications and Facts:

1-It prevents layers from skidding during vehicle pass.

2-It makes the surface smooth and seals the cracks.

3-Size of the aggregates must be 6 to 10 mm.

4-Sand Seal is very cost effective.

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MICRO SURFACING

Applying a mixture of aggregates, water, CSS bitumen emulsion and filler (usually cement) and some additives like latex according to place condition. It requires a special paving machine that can be assembled on site. The best time for adding latex to the bitumen emulsion is after pouring bitumen emulsion in the micro surfacing paving machine.

Micro Surfacing Applications and Facts:

1-There is no need to roll with any kind of road roller.

2-We can find out end of the breaking process when brown color turns to black color.

3-It is so recommended for places with high traffic like big cities, airports and high ways.

4-It is very resistant to fatigue and attrition.

5-It creates a good color contrast.

6-It can be used as a colored coat by adding some additives (used for bike lanes).

7-When using Micro surfacing on the bridge surface, there is no need to trench the surface due to its light weight and low thickness.

8-It can be used on both asphalt and concrete surfaces.

9-It is average life time is 5 to 7 years.

10-Micro surfacing seals cracks and voids and completely makes the surface smooth.

11-It is very economical.

12-Because of its low thickness, there is no need to bring the position of guard rails, curbstones or shoulder of the road upper.

13-Use of thermal energy, fuel and aggregates are less than similar approaches in the whole paving process.

14-Micro surfacing is very proper for environment.

15-Since there is no need to roll with road rollers, Micro surfacing surface may crack or it may cause reflective cracks in places with big cracks or places where two lanes reach together or places where two roads intersect. So, we should note to seal it.

16-The aggregates' sizes must be proper for the Micro surfacing.

17-Before implementing the coat, the surface must be free from dust, oil and even road lining.

18-If there are transverse, longitudinal, block or crocodile cracks or vehicle tire grooves, they must be sealed firstly (with bitumen emulsion CSS or CRS) and then, it is prepared for Micro surfacing.

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COLD MIX

A mixture of CMS or CSS bitumen emulsion emulsion and aggregates which can be produced in plant or on site. It can be kept or transported in bulk packing, bag or bucket. Cold mix remains brown and ready for usage within 2 weeks up to 1 month without heating when packed in bags.

Cold Mix Applications and Facts:

1-Suitable for temporary crack sealing that can even be used on wet surface.

2-It is flexible, however, stable against climatic changes.

3-Cold Mix can be produced on site or in plant.

4-Only bitumen emulsion is proper for producing Cold Mix which sticks to the aggregates very well.

5-Completely environment friendly during producing and paving process and no heating is required.

6-The traffic can pass on it after breaking process.

7-When producing Cold Mix, the aggregates must be washed free from dust. 0 to 3 mm aggregates should be removed to prevent the mix from being coagulated.

8-Cold Mix can be kept for 2 to 7 days in bulk packing or for 2 weeks to 1 month in bags or buckets and it can be recycled either.

9-Cold Mix is the only choice for places far from hot mix asphalt plants.

10-Dust and oil must be cleaned off the cracks or holes.

11-Production and transportation processes are cost effective.

MULCHING AND SOIL STABILIZATION

Spraying CMS or CSS bitumen emulsion on surfaces to prevent dust lifting.

Mulching and Soil Stabilization Application Facts:

1-Since bitumen emulsion has ionic structure, its adhesion is very stronger than neutral cutback bitumen for different applications such as Mulching.

2-Mulching with bitumen emulsion is flexible and when facing with climatic changes, it is also stable.

3-It is completely harmless for environment and can be applied in ambient temperature.

4-Breaking process of Mulching takes about than 4 hours.

5-The cost is very efficient.

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France	
643,801	Area (Km²)
1,000,000	Paved Roads (Km)
1,000,000	Bitumen Emulsion Consumption (Tons)

England	
243,610	Area (Km²)
422,000	Paved Roads (Km)
153,000	Bitumen Emulsion Consumption (Tons)

Germany	
357,376	Area (Km²)
644,000	Paved Roads (Km)
130,000	Bitumen Emulsion Consumption (Tons)

Italy	
301,338	Area (Km²)
488,000	Paved Roads (Km)
100,000	Bitumen Emulsion Consumption (Tons)

Turkey	
783,562	Area (Km²)
400,000	Paved Roads (Km)
100,000	Bitumen Emulsion Consumption (Tons)

Iran	
1,648,000	Area (Km²)
250,000	Paved Roads (Km)
40,000	Bitumen Emulsion Consumption (Tons)

America	
9,834,000	Area (Km²)
4,300,000	Paved Roads (Km)
1,930,000	Bitumen Emulsion Consumption (Tons)

Mexico	
1,973,000	Area (Km²)
230,000	Paved Roads (Km)
350,000	Bitumen Emulsion Consumption (Tons)

Spain	
506,000	Area (Km²)
683,000	Paved Roads (Km)
250,000	Bitumen Emulsion Consumption (Tons)

India	
1,269,219	Area (Km²)
2,000,000	Paved Roads (Km)
448,000	Bitumen Emulsion Consumption (Tons)

Malaysia	
327,000	Area (Km²)
150,000	Paved Roads (Km)
70,000	Bitumen Emulsion Consumption (Tons)

Japan	
378,000	Area (Km²)
973,000	Paved Roads (Km)
250,000	Bitumen Emulsion Consumption (Tons)

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COMPREHENSIVE SUPPORT

The strength of our organization is our ability to provide a wide range of application solutions to our customers worldwide. We have the ability to help customers deal with complex challenges related to the type of bitumen emulsion that they need, aggregates, chemical additives and equipment. Moreover, we supply any kinds of made-to-order bitumen emulsion.

SUPPLYING DOMESTIC AND FOREIGN NEEDS IS OUR MOST IMPORTANT MISSION

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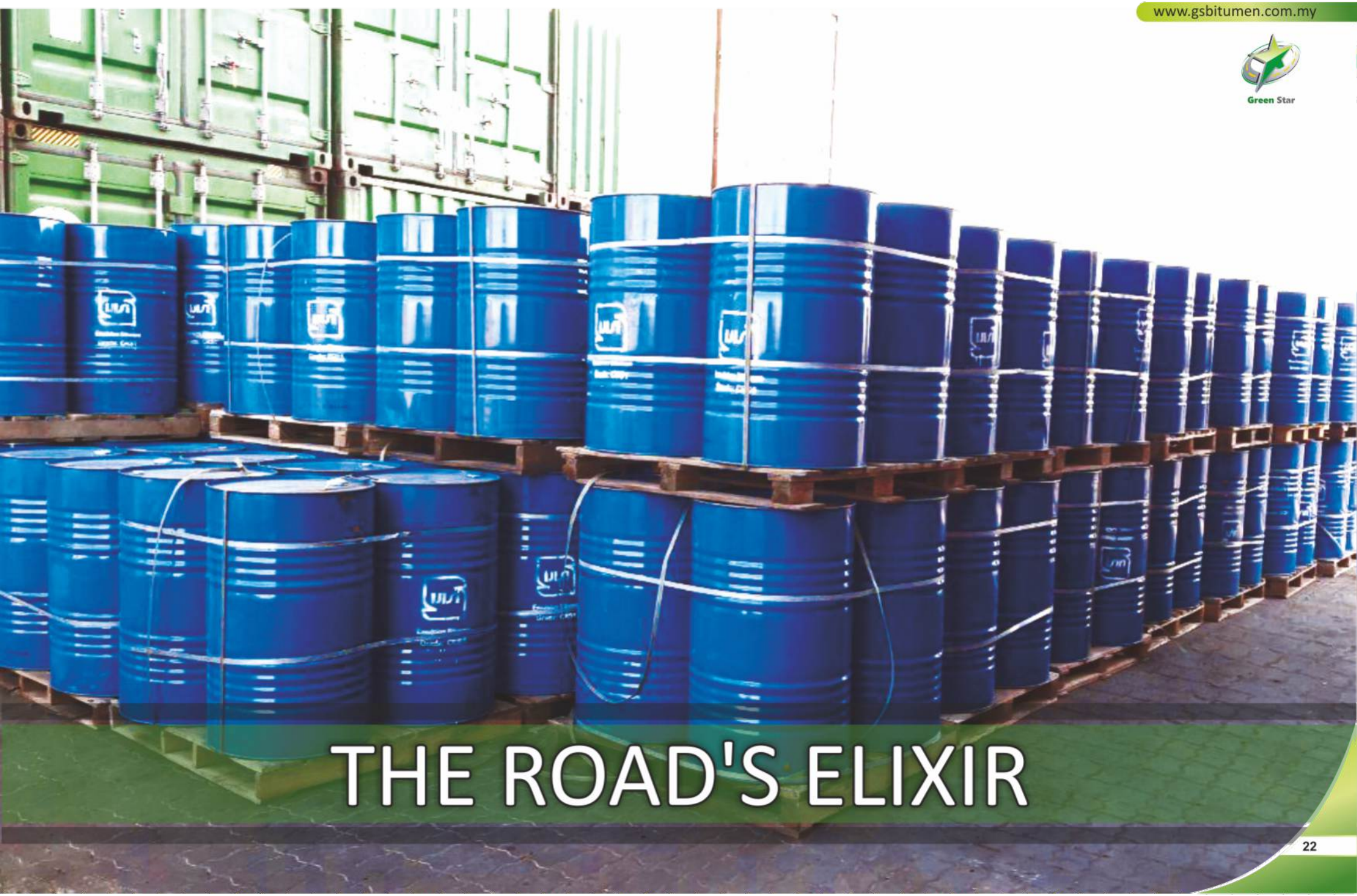

THE ROAD'S ELIXIR

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