

INDO  
AMINES  
AMERICAS LLC



## Road Construction Chemical

**Paving the World's Road  
Toward Development**

### **Indo Amines Ltd.**

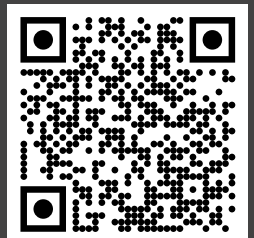
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## Company Profile

**Indo Amines Americas LLC (IALLC)** is a subsidiary of Indo Amines Ltd (IAL). IAL is one of the largest manufacturing company in South Asia of its kind. IAL is a global supplier of Fine Chemicals, Specialty Chemicals and Performance Chemicals. IAL serves Agrochemicals, Fertilizers, Oil & Gas, Road Construction, Pesticides, Dyes and Pigments, Pharmaceuticals, Coatings & many other market segments.

**IALLC** operates its business in a socially & environmentally sustainable manner and is committed to bring value to the world and to its customers.

## Asphalt / Bitumen Additives

Asphalt/Bitumen Segment	Functionality	Products & Grades*	Benefits
Hot Mix / Warm Mix Asphalt	Antistripping	INDOSTRIP-NR-91	Moisture resistance for longer asphalt life
Cold Application/ Emulsions	Cationic Emulsifier	INDO R-COTE-RS	Emulsifier for rapid-setting asphalt
	Cationic Emulsifier	INDO R-COTE SS-50	Emulsifier for slow-setting asphalt
	Cationic Emulsifier	INDO R-CPAT M-505	Asphalt Micro-surfacing

Products are available in drums and ISO container.



# Antistripping Agents INDOSTRIP-NR-91

## Recipe:

Take hot bitumen of temperature about 140-150°C. then add 0.5 % of antistripping agent and stir for 5-10 minutes. after that take the hot aggregate (temp about 160°C.) about 200 gms And add 5% dose of that mixture and mix well.

Place at room temperature for 2 hour. after that check water boiling test.

## Preparation:

Bitumen: 99.5 %

INDORSTRIP-NR-91: 0.5 ±0.3%

**Total: 100 %**

## Under Water Coating Test:

Take a container of nearly about 1000 ml capacity.

Fill the container with water nearly about 70 %. Take about 200 gms of aggregate and put into container. Add about 5 % bitumen with antistripping agent. Then close the container tight and shake for 2 minutes. After 2 mins drain water and remove the aggregate from container on a white paper. And check the coating percentage.

## Boiling Water Test:

Take coated aggregate nearly about 200 gms and add in boiling water container. Then boil the coated aggregate to about 10 mins. After 10 mins cool the container and remove the water from container, put aggregate on a white paper and check the coating percentage.

## Analysis:

TEST	SPECIFICATION
Boiling test	Antistripping percentage is 75% min
Under water coating test	Antistripping percentage is 80% min

## Application:

Anti-stripping agents are often overlooked when boosting the performance of asphalt.

This document discusses how anti-stripping agents can eliminate the possibility of some instabilities in asphalt, such as crumbling and the formation of holes.

Many developments in the past 50 years have improved the performances of bituminous mixtures and allowed the recycling of more materials coming from the demolition of old pavements. This, happily, leads to a reduction of environmental impact through less use of non-renewable first-use raw material.

To increase asphalt concrete performances we are focused on the use of modification polymers, both for bitumen - PMB, Polymer Modified Bitumen - both for mixtures - PMA, Polymer Modified Asphalt. We are not giving importance to bitumen-aggregate adhesion which is independent from any polymer modification performed.

Perfect adhesion between the binder and the stone elements prevents water from filtering between the two materials, causing premature aging of the bituminous mixture and leading to the formation of instabilities that decrease the pavement's performances.

Better adhesion between aggregates and bitumen can be ensured through the usage of anti-stripping agents.



Aggregates: Bitumen without Antistripping agent, after Boiling Test.



Aggregates: Bitumen with Antistripping agent, after Boiling Test.



# Microsurfacing Emulsifier INDORCOTE-M-505

## Recipe:

Take hot bitumen mixed with Additive and heated upto 140-150°C.  
In another vessel, take hot water, HCl and emulsifier (INDORCOTE-M-505)  
After that add latex. Then maintain the pH of the solution to 1.5-2.5 (Acidic). Then prepare batch by mixing bitumen with soap solution by using colloidal mill Start colloidal mill and mix first addition of soap solution followed by slow addition of bitumen. After complete addition mix the solution for 3 mins. and drain the emulsion batch for testing. Test should be done after 12 hrs.

## Preparation:

Bitumen:	62 ± 2%
Additive:	0.5 ± 0.1%
Water:	31.0%
Acid:	1%
INDORCOTE-M-505:	1.5 ± 0.5%
Latex:	4 ± 1%
<b>Total:</b>	<b>100%</b>

## NOTE:

- 1) Bitumen: It should be of VG-30 grade.
- 2) Additive: It should be of good quality.
- 3) Water: Water with acidic pH
- 4) Acid: HCl must be constant percentage(35%)
- 5) Emulsifier: INDORCOTE-M-505
- 6) Latex: It should be commercial grade.

## Analysis:

TEST	SPECIFICATION
Sieve test (600 micron)	0.05 %
Viscosity on saybolt viscometer	Min 12 sec.
Cement test	1 %
Water miscibility	Soluble in water

## Micro-surfacing application and facts:

- There is no need to roll with any kind of road roller.
- We can find out the end of the breaking process when the brown color turns to black color.
- It is so recommended for places with high traffic like big cities, airports and high ways.
- It is very resistant to fatigue and attrition.
- It creates a good color contrast.
- It can be used as a colored coat by adding some additives (used for bike lanes).
- When using Micro-surfacing on the bridge surface, there is no need to trench the surface due to its light weight and low thickness.
- It can be used on both asphalt and concrete surfaces.
- It's average life time is 5 to 7 years.
- Micro-surfacing seals cracks and voids and completely makes the surface smooth.
- It is very economical.
- Because of its low thickness, there is no need to bring the position of guard rails, curbstones or shoulder of the road upper.
- Use of thermal energy, fuel, and aggregates are less than similar approaches in the whole paving process.
- Micro-surfacing is very proper for the environment.
- 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.
- The aggregates' sizes must be proper for the Micro-surfacing.
- Before implementing the coat, the surface must be free from dust, oil and even road lining.



# Rapid Setting Emulsifier 1 INDORCOTE-RS

## Recipe:

Take hot bitumen mixed with kerosene and heated upto 140 - 150°C.

In another vessel, take hot water, HCl and emulsifier (INDORCOTE-RS). Then add CaCl<sub>2</sub> and starch maintain the pH of the solution to 1.5-2.5 (Acidic). After that prepare batch by mixing bitumen with soap solution by using colloidal mill. Start colloidal mill and mix first addition of soap solution followed by slow addition of bitumen. After complete addition mix the solution for 3 mins. and drain the emulsion batch for testing. Test should be done after 12 hrs.

## Procedure for Starch cooking :

Take water about 100 gms from total percentage of water in emulsion and heat about 60-70 °C. then add 1% starch (which is used to emulsion ) to hot water and start continuous stirring until a viscous ,uniform, pasty solution is formed.

## Preparation:

Bitumen:	60 %
Kerosene:	1.5%
Water:	36.9%
HCl:	0.3%
INDORCOTE-RS:	0.3% ± 0.05%
CaCl <sub>2</sub> :	0.5 %
Starch	0.5%
<b>Total:</b>	<b>100 %</b>

## NOTE:

- 1) Bitumen: It should be of VG-30 grade.
- 2) Kerosene: It should be of good quality.
- 3) Water: Water with acidic pH
- 4) Acid: HCl must be constant percentage.(35 % )
- 5) Emulsifier: INDORCOTE-RS
- 6) CaCl<sub>2</sub>: It should be commercial grade.

## Application:

When the bitumen emulsion is applied on the aggregate for the road works the water evaporates leaving behind the bitumen droplets. These droplets spread on the aggregate and bind with each other and gains strength eventually.

## Rapid setting emulsion:

This type of bitumen emulsion breaks down rapidly as it comes with contact with aggregate helping in fast setting and rapid curing.

## Analysis:

TEST	SPECIFICATION
Sieve test (600 micron)	Max retained 0.05 %
Viscosity on saybolt viscometer	Min 20sec
Cement test	NA
Water miscibility	Soluble in water
Residue	Min.55 %

# Rapid Setting Emulsifier 2 INDORCOTE-RS

## Recipe:

Take hot bitumen mixed with kerosene and heated upto 140-150°C.

In another vessel, take hot water, HCl and emulsifier (INDORCOTE-RS). Then add CaCl<sub>2</sub> and starch maintain the pH of the solution to 1.5-2.5 (Acidic). After that prepare batch by mixing bitumen with soap solution by using colloidal mill. Start colloidal mill and mix first addition of soap solution followed by slow addition of bitumen. After complete addition mix the solution for 3 mins. and drain the emulsion batch for testing. Test should be done after 12 hrs.

## Procedure for Starch cooking :

Take water about 100 gms from total percentage of water in emulsion and heat about 60-70 °C. then add 1% starch (which is used to emulsion ) to hot water and start continuous stirring until a viscous ,uniform, pasty solution is formed.

## Preparation:

Bitumen:	62%
Kerosene:	1.5 ± 0.5%
Water:	34.30%
HCl:	0.4%
INDORCOTE RS:	0.3% ± 0.05%
CaCl <sub>2</sub> :	0.5 ± 0.1%
Starch	1%
<b>Total:</b>	<b>100%</b>

## NOTE:

- 1) Bitumen: It should be of VG-30 grade.
- 2) Kerosene: It should be of good quality.
- 3) Water: Water with acidic pH
- 4) Acid: HCl must be constant percentage(35%)
- 5) Emulsifier: INDORCOTE-RS
- 6) CaCl<sub>2</sub>: It should be commercial grade.

## Application:

When the bitumen emulsion is applied on the aggregate for the road works the water evaporates leaving behind the bitumen droplets. These droplets spread on the aggregate and bind with each other and gains strength eventually.

## Rapid setting emulsion 2 :

This type of bitumen emulsion breaks down rapidly as it comes with contact with aggregate helping in fast setting and rapid curing.



## Analysis:

TEST	SPECIFICATION
Sieve test (600 micron)	Max retained 0.05 %
Viscosity on saybolt viscometer	Min 20sec
Water miscibility	Soluble in water
Residue	Min. 60 %

# Slow Setting Emulsifier 1 INDORCOTE-SS-50

## Recipe:

Take hot bitumen mixed with Kerosene and heated upto 140 - 150°C.

In another vessel, take hot water, add HCl and emulsifier (INDORCOTE-SS-50). Then add starch (cooked) and maintain the pH of the solution to 2.5-4.0. After that prepare the batch by mixing bitumen with Soap solution by using colloidal mill. Start colloidal mill and mix first addition of soap solution followed by slow addition of bitumen. After complete addition mix the solution for 3 mins. and drain the emulsion batch for testing. Test should be done after 12 hrs.

## Procedure for Starch cooking :

Take water about 100 gms from total percentage of water in emulsion and heat about 60-70 °C. then add 1% starch (which is used to emulsion ) to hot water and start continuous stirring until a viscous ,uniform, pasty solution is formed.

## Preparation:

Bitumen:	57 ± 1%
Kerosene:	1% ± 0.5 %
Water:	40 %
HCl:	0.3 %
INDORCOTE-SS-50:	0.7% ± 0.1%
Starch(cooked):	1 ± 0.5%
<b>Total:</b>	<b>100 %</b>

## NOTE:

- 1) Bitumen: It should be of VG-30 grade.
- 2) Kerosene: It should be of good quality.
- 3) Water: Water with acidic pH
- 4) Acid: HCl must be constant percentage( 35 %)
- 5) Emulsifier: INDORCOTE-SS-50
- 6) Malze Starch: It should be cooked

## Application:

Prime coat typically is application of low viscosity Bitumen over a granular base, preparing it for laying an asphalt mixture on it. A prime coat performs several important functions.

Coats and bonds loose material particles on the surface of the base.

Hardens or toughens the surface of the base.

Waterproofs the surface of the base by plugging capillary or interconnected voids Provides adhesion or bond between the base and the asphalt mixture.

Bitumen emulsions used for Prime Coat are Cationic Slow Setting Emulsion 1.

## Analysis:

TEST	SPECIFICATION
Seive test (600 micron)	Max retained 0.05 %
Viscosity on saybolt viscometer	Min 20sec
Cement test	1 %
Water miscibility	Soluble in water
Residue	Min. 55 %



# Slow Setting Emulsifier 2 INDORCOTE-SS

## Recipe:

Take hot bitumen mixed with Kerosene and heated upto 140-150°C.

In another vessel, take hot water, add HCl and emulsifier (INDORCOTE-SS). Then add starch (cooked) and maintain the pH of the solution to 2.5-4.0. After that prepare the batch by mixing bitumen with soap solution by using colloidal mill. Start colloidal mill and mix first addition of soap solution followed by slow addition of bitumen. After complete addition mix the solution for 3 mins. and drain the emulsion batch for testing. Test should be done after 12 hrs.

### Procedure for starch cooking :

Take water about 100 gms from total percentage of water in emulsion and heat about 60-70 °C. then add 1% starch (which is used to emulsion) to hot water and start continuous stirring until a viscous ,uniform, pasty solution is formed.

## Preparation:

Bitumen:	60% ± 1 %
Kerosene:	2 %
Water:	35.5 %
HCl:	0.5%
INDORCOTE-SS:	1-2 %
Starch(cooked):	1 %
<b>Total:</b>	<b>100 %</b>

### NOTE:

- 1) Bitumen: It should be of VG-30 grade.
- 2) Kerosene: It should be of good quality.
- 3) Water: Water with acidic pH
- 4) Acid: HCl must be constant percentage(35%)
- 5) Emulsifier: INDORCOTE-SS
- 6) Maize Starch: It should be cooked.

## Application:

- Prime coat typically is application of High viscosity Bitumen over a granular base, preparing it for laying an asphalt mixture on it. A prime coat performs several important functions.
- Coats and bonds loose material particles on the surface of the base.
- Hardens or toughens the surface of the base.
- Waterproofs the surface of the base by plugging capillary or interconnected voids Provides adhesion or bond between the base and the asphalt mixture.
- Bitumen emulsions used for Prime Coat are Cationic Slow Setting Emulsion 2 as per latest MoRTH specifications.

## Analysis:

TEST	SPECIFICATION
Sieve test (600 micron)	Max retained 0.05 %
Viscosity on saybolt viscometer	Min 25 sec
Cement test	1 %
Water miscibility	Soluble in water
Residue	Min. 55 %

