



ravasol  
ASPHALT

Your road  
to solution





## ASPHALT

At Ravago Chemicals, we are involved in developing and marketing engineered technical solutions connected to the Asphalt Segment, both paving and waterproofing.

Our experience and commitment are the key values we grant to our customers through our team of experts and extensive market knowledge. Always keen on being side to side with our business partners, committed to providing support and offering creative solutions to accomplish their needs through our abilities in:

- ◆ R&D and manufacture of innovative formulated chemical products.
- ◆ Laboratory assistance for asphalt mix, PMB and bitumen emulsions recipes.
- ◆ Technical assistance at production and job sites.
- ◆ Partnerships with International Roads Associations and Universities.
- ◆ Know-how and advanced technology transfer solutions.

We strive to deliver excellence in every part of our business by attending domestic markets and external markets through distribution network and certified agencies; focusing on the Asphalt projects around Europe, CIS, Latin America and North Africa.

# OUR SOLUTIONS



## Chemical & Physical Bitumen Modification

### ADHESION PROMOTERS

AP592 / APV70  
APF3 / APA7

### BITUMEN MODIFIERS

COPOLEX / MELTIC / BITLINKER  
ELAST / UPGRADE / ASN  
PPA / CR / TACK



## Asphalt Mix Performance Enhance

BITCEL / ICE  
4RUT / PLAST



## Bitumen Emulsions

### EMULSIFIERS

AMIN-RS / AMIN-SSE  
AMIN-QS / AMIN-DOP

### PHYSICAL MODIFIERS

TEX / NTT / E-FLUX  
SOLV-W / THICK

### CHEMICAL MODIFIERS

STEADY / SAPO-H33  
SAPO-F75 / ACID-E



## Decorative Pavements & Protective Treatments

### COLOURED MIX HOT APPLIED

COLOR+ R / COLOR+ SERIES / CB-5

### COLD APPLIED COATINGS

BOND SYSTEM / TOPGUM SYSTEM  
GRIP / GLOW RANGE / SEAL

### SURFACE PROTECTION

ANTIKER / STAB-33 / DUST  
SKIN-41 / BITBLACK / PERCOLA



## Environmental Solutions

### WARM MIX ADDITIVES

THERMO+ / BITFOAM / W111

### RELEASE AGENTS & CLEANERS

BIO-3 / BIO-6 / BIO-7

### RECLAIMED ASPHALT PAVEMENTS

RAP-5V

### FUMES ABATEMENT PRODUCTS

ODOUR



## Miscellaneous

### ROAD MAINTENANCE

FLEX / MAFE / E-COLD

### WATER PROOFING

PROOF RANGE

### LAB CHEMICALS

SOLV-P / SOLV-T

### BITUMINOUS BINDERS

BIND



## Technical & Service Support

LABORATORY ASSISTANCE  
ON-SITE TECHNICAL ASSISTANCE  
DOSING EQUIPMENT  
KNOW-HOW  
TAILOR-MADE PACKAGING  
GLOBAL LOGISTIC CAPABILITIES



Liquid



Powder



Granule



Pellet



Paste



Solid



Fiber



# Chemical & Physical Bitumen Modification

-  **ADHESION PROMOTERS**
-  **BITUMEN MODIFIERS**



ADHESION PROMOTER



**APS92**

## **SILANE BASE ADHESION PROMOTER**

A new concept liquid antistrip, based on nanotech silane chemistry, formulated to improve the passive adhesion between aggregate and bitumen, even at very low dosage. It helps to grant an unbreakable binder/aggregate link during pavement service life. Its tensioactive property modifies the bitumen polarity and enhances the chemical attraction in acid aggregates such as granite, silica, porphyry, basalt and quartzite gravel. Improves Water Sensitivity in mixtures (EN 12697-12), Dynamic Modulus, Density, Particle Loss and Compaction ability. Odor-free, heat-resistant and storage stable when added into hot bitumen.

**RECOMMENDED DOSAGE:**  
0.05% to 0.15% by weight of bitumen.



ADHESION PROMOTER



**APV70**

## **GREEN ADHESION PROMOTER**

A new generation vegetal base liquid antistripping additive. It grants an unbreakable binder-aggregate link during pavement service life (passive adhesion). Its tensioactive property modifies the bitumen polarity and enhances the chemical attraction in acid aggregates such as granite, silica, porphyry, basalt and quartzite gravel. Improves Water Sensitivity in mixtures (EN 12697-12), Dynamic Modulus, Density, Compaction ability. Odor-free, heat-resistant and storage stable when added into hot bitumen. Formulated with renewable natural compounds that avoid any kind of hazardous classification.

**RECOMMENDED DOSAGE:**  
0.10% to 0.50% by weight of bitumen.



ADHESION PROMOTER



**APF3**

## **PHOSPHATE BASE ADHESION PROMOTER**

Liquid antistrip composed of phosphate chemicals, designed to improve the passive adhesion between aggregate and bitumen. It helps to grant an unbreakable binder/aggregate link during pavement service life. Its tensioactive property modifies the bitumen polarity and enhances the chemical attraction in acid aggregates such as granite, silica, porphyry, basalt and quartzite gravel. Improves Water Sensitivity in mixtures (EN 12697-12), Dynamic Modulus, Density, Particle Loss and Compaction ability. Heat-resistant and storage stable when added into hot bitumen.

**RECOMMENDED DOSAGE:**  
0.20% to 0.60% by weight of bitumen.



ADHESION  
PROMOTER



APA7



### AMINE BASE ADHESION PROMOTER

Liquid antistrip composed of amine chemicals, designed to improve the passive adhesion between aggregate and bitumen. It helps to grant an unbreakable binder/aggregate link during pavement service life. Its tensioactive property modifies the bitumen polarity and enhances the chemical attraction in acid aggregates such as granite, silica, porphyry, basalt and quartzite gravel. Improves Water Sensitivity in mixtures (EN 12697-12), Dynamic Modulus, Density, Particle Loss and Compaction ability.

**RECOMMENDED DOSAGE:**

0.20% to 0.75% by weight of bitumen.



BITUMEN  
MODIFIER



COPOLEX



### COPOLYMER FOR PMB PRODUCTION

Granular copolymer used for PMB and asphalt mix rheological modification. High compatibility with a wide range of bitumen sources providing excellent performance. Apply slight agitation for a complete dispersion. Heat-resistant and store stable when added into hot binder, it expands PMB temperature susceptibility behavior. Available in a wide range of molecular weight and grades to achieve required PMB specification.

**RECOMMENDED DOSAGE:**

1.5% to 5.0% by weight of bitumen.



BITUMEN  
MODIFIER



MELTIC



### AROMATIC THINNER FOR PMB PRODUCTION

Liquid hydrocarbon derivate thinner, specifically used to favor PMB compatibility (modified bitumen produced with SBR/SBS polymers and/or crumb rubber) due to its aromatic fractions content. It provides softener effect to the penetration parameter that allows the use of harder bitumen. Heat-resistant and storage stable when dosed into hot binder.

**RECOMMENDED DOSAGE:**

0.5% to 3.0% by weight of bitumen.



BITUMEN  
MODIFIER



BITLINKER



### STABILISER FOR PMB PRODUCTION

A cross-linking agent in granular form, specifically developed to favour stability in PMB (modified bitumen with SBR/SBS polymers) for long storage periods. It contains chemical catalysts, accelerators and bond agents that enhance a polymer/bitumen stable network. This format favors the PMB handling process. It provides full and quick dispersion into the bitumen with a significant decrease of H<sub>2</sub>S release. The cross-linking effect optimises polymer interaction with bitumen. It also improves binder rheological performances and allows reduction of polymer content.

**RECOMMENDED DOSAGE:**

0.10% to 0.25% by weight of bitumen.



BITUMEN  
MODIFIER



ELAST



### POLYMER FOR PMB PRODUCTION

Thermoplastic copolymer rubber used for PMB and asphalt mix rheological modification. It expands the temperature susceptibility, elastic recovery of the bitumen as well as it helps to reduce rutting in hot mix pavements (EN 12697-22). Available in powder and granule forms, linear and radial with different molecular weights.

**RECOMMENDED DOSAGE:**

3.0% to 5.0% by weight of bitumen.



BITUMEN  
MODIFIER



UPGRADE

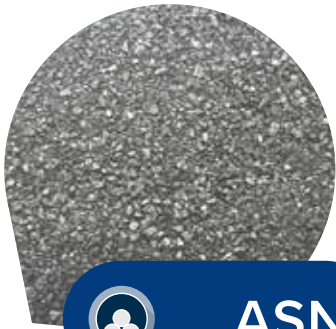


### PERFORMANCE GRADE IMPROVER

Polymeric additive that modifies bitumen rheology to enhance high service temperature performances by boosting its softening point. When dosed into the bitumen it improves PG (performance grade) complex modulus, maintaining unchanged low temperature values. Heat-resistance and store stable when added into hot bitumen. Due to its chemical composition it decreases PMB viscosity and when dosed together with SBS allows a sensible reduction of polymer content.

**RECOMMENDED DOSAGE:**

0.7% to 4.0% by weight of bitumen.



BITUMEN  
MODIFIER



ASN

### NATURAL ASPHALT

Natural resin composed of high purity hydrocarbons, also named “asphaltite” or “gilsonite”. It is a solid bitumen coming from treated petroleum rocks highly compatible with asphalt binders. Suggested applications are: airport aprons, highways, bus lanes, industrial areas, ports, toll stations, roundabouts, etc., when higher bearing capacity is requested.

**RECOMMENDED DOSAGE:**  
2% to 15% by weight of bitumen.



BITUMEN  
MODIFIER



PPA

### BINDER ADDITIVE AND MODIFIER

Liquid additive used in production of distinctive asphalt materials. It acts as a catalyst agent in PMB (elastomers and reactive terpolymers) and as bitumen hardener. Heat-resistant and storage stable when dosed into hot binder. For complete dispersion, ensure a slight agitation or recirculation.

**RECOMMENDED DOSAGE:**  
0.10% to 5.00% by weight of bitumen.



BITUMEN  
MODIFIER



CR

### CRUMB RUBBER

Recycled crumb rubber obtained by 100% truck tyres mechanical grinding, utilised for bitumen and asphalt mix rheological modification. Suitable for manufacturing CRMB and high viscosity modified bitumen. It can be added to bitumen tanks ensuring continuous agitation, either with or without passage through high shear mill. Available in different sizes for specific applications: CR8 (< 0,8mm), CR5 (< 0,5mm) and CR4 (< 0,4mm).

**RECOMMENDED DOSAGE:**  
Variable depending on service and final application.



BITUMEN  
MODIFIER



TACK

### BITUMEN TACKY AGENT

A granular thermoplastic resin used as an adhesion enhancer in bitumen modification rheology. Its addition acts on binder resin structure balance. In polymer modified bitumen, it interacts with the elastomers (SBC) improving PMB tensile strength. Heat-resistant product.

**RECOMMENDED DOSAGE:**  
0.5% to 15.0% by weight of bitumen.

# Asphalt Mix Performance Enhance



**BITCEL**



**CELLULOSE FIBER**

A compressed cellulose fiber, bitumen drainage inhibitor, used as a binder stabiliser in hot mix production with high bitumen content: SMA, porous asphalt, asphalt thin layers, high module mixes, SAMI. Recommended for long lasting pavement durability. It helps to provide greater resistance to fatigue and cracks propagation (EN 12697-18 and -24). Different hybrid grades also available. BITCEL-W incorporates a rheological modifier that improves temperature susceptibility and workability in hot mixtures.

**RECOMMENDED DOSAGE:**

0.3% to 0.5% by weight of total asphalt mix.



**ICE**



**ANTI-ICE ADDITIVE**

Powder additive specifically formulated to be used as an antifreeze agent for pavements subjected to frequent low temperatures weather conditions, ice accumulation and snow. Its hydrophobic behaviour allows it to interact by contact with the ice to drop the water freezing point to -6°C (21°F) creating a non-adherent interface between the ice and the pavement surface. Versatile safety solution for bridges, slippery areas. Commonly used in hot mix asphalt and Micro Surfacing applications.

**RECOMMENDED DOSAGE:**

3.0 to 5.0% by weight of aggregates.



**4 RUT**



**WARM MIX PERFORMING ADDITIVE**

Warm mix asphalt additive that reduces binder viscosity in asphalt mixes either in production or during laying and compaction. It allows dropping down temperatures up to 30°C (54°F) in all these processes. During cooling step of the asphalt mix pavement, the additive starts crystallizing, increasing pavement rutting resistance. It can be dosed during mixing process into the pug-mill (dry process) or into the bitumen tank (wet process) being sure to provide a slight agitation for complete dispersion.

**RECOMMENDED DOSAGE:**

1.5% to 3.0% by weight of bitumen



**PLAST**



**RHEOLOGICAL ENHANCER POLYMER**

Polymer produced through the extrusion of additives and high molecular weight thermoplastic polyalkenes mixture. It is recommended in asphalt mixture direct modification with the aim to provide to pavement layer a higher resistance to permanent deformation (EN 12697-22). Used in high dosages when a significant increase in stiffness is required (EN 12697-26). Add the product directly into the pug-mill (batch plants) at same time aggregate fills in. It can also be added in continuous drum mixer plants.

**RECOMMENDED DOSAGE:**

4.0% to 10.0% by weight of bitumen.



# Bitumen Emulsions

-  EMULSIFIERS
-  PHYSICAL MODIFIERS
-  CHEMICAL MODIFIERS



EMULSIFIER



**AMIN-RS**

 **EMULSIFIER FOR CRS AND CMS EMULSIONS**

Liquid emulsifier specifically formulated for Cationic Rapid and Medium Bitumen Emulsions. It is used to produce tack coat, surface dressing and open grade cold mixes emulsions. Its liquid formula at room temperature provides considerable advantages in handling water phase preparation.

**RECOMMENDED DOSAGE**

0.20% to 0.25% by weight of total emulsion; Tack coat and surface dressing.

0.35% to 0.50% by weight of total emulsion; Open grade cold mixes.



EMULSIFIER



**AMIN-SSE**

 **EMULSIFIER FOR CSS EMULSIONS**

Liquid emulsifier specifically formulated for cationic slow setting (CSS) bitumen emulsions. This product enables to process emulsions with required high storage stability and good cohesion between aggregate and bitumen. Studied for the production of "grave emulsion", cold recycling (in situ or in plant) and dense grade cold mixes applications.

**RECOMMENDED DOSAGE**

0.40 to 0.70% by weight of total emulsion; Prime coat.

0.70 to 1.40% by weight of total emulsion; G/E, Cold recycling, Dense grade cold mix and Half-Warm mix.



EMULSIFIER



**AMIN-QS**

 **SPECIAL EMULSIFIER FOR CQS EMULSIONS**

Liquid emulsifier specifically formulated for the production of Slurry Seal and Micro Surfacing applications with controlled setting time (CQS). It provides fast and tough cohesion to the mixture enhancing a rapid traffic re-opening (EN 12274-4). The perfect emulsifier to be used for any emulsions produced with low quality bitumen.

**RECOMMENDED DOSAGE:**

0.60 to 0.80% by weight of total emulsion; Micro and Slurry seal.

0.30 to 1.00% by weight of total emulsion; Open grade cold mix, Cold recycling, Half-warm mix.





EMULSIFIER



AMIN-DOP

### BREAK CONTROL ADDITIVES FOR CQS EMULSIONS

Quick setting emulsion break control additives. Several grades delivered at different concentrations, which have to be used to extend the mixing time of Micro Surfacing and Slurry Seal (CQS) applications. These additives consists in organic polymers with amino groups and surfactant properties. The pure concentrated grade has to be diluted on site applying a proportion of 1 to 9 parts of water.

**RECOMMENDED DOSAGE:**

Variable, depending grade, on site materials and applications.



PHYSICAL MODIFIER



TEX

### SBR CATIONIC LATEX

Styrene-butadiene-rubber polymer dispersion with high solid content, formulated for cationic bitumen emulsions modification to improve physical properties such as viscosity, elastic recovery, temperature susceptibility and adhesion between binder and aggregates. The product has to be preferably added to water phase in batch plants or may also be dosed into ready-made emulsion, ensuring a slight agitation to improve the dispersion.

**RECOMMENDED DOSAGE:**

2.0 to 4.0% by weight of total emulsion.



PHYSICAL MODIFIER



NTT

### ADDITIVE FOR CRS ANTI-STICKING EMULSIONS

Liquid bitumen hardener additive, which permits to produce so called non-tacky-tack emulsions, in combination with a CRS emulsifier. Its addition to the emulsions avoids the use of low Pen bitumen (20/30) that could give problems in emulsification. The product has to be dosed into the water phase. It will replace, almost entirely, the hydrochloric acid. Its dosage depends on bitumen grade.

**RECOMMENDED DOSAGE:**

0.70% to 1.00% by weight of total emulsion, (Pen ~30 dmm).

1.00% to 1.30% by weight of total emulsion, (Pen ~50 dmm).

> 1.60% by weight of total emulsion, (Pen ~70 dmm).



PHYSICAL MODIFIER



E-FLUX

### GREEN BITUMEN EMULSION FLUXANT

Vegetal based liquid fluxant used in bitumen emulsions formulation. It grants better softening behaviour than other traditional thinners (mineral sources), therefore dosage can be reduced. It is compatible with any bitumen. It can be added directly to the binder during the production process. Odor-free, heat-resistant product and storage stable when dosed into the bitumen, composed of renewable natural compounds that avoid any kind of hazardous classification.

**RECOMMENDED DOSAGE:**

1.0% to 5.0% by weight of bitumen.



PHYSICAL MODIFIER



SOLV-W

### BITUMEN EMULSION SOLVENT

A liquid thinner additive used as a flux agent in the production of bitumen emulsions. Its use reduces the emulsion viscosity and improves workability in cold mixes. Required product amount has to be adjusted in accordance with the final application and local source of raw materials.

**RECOMMENDED DOSAGE:**

0.5% to 12.0% by weight of total emulsion.



PHYSICAL MODIFIER



THICK

### VISCO-BUILDER

Powder additive used as thickener in bitumen emulsions (acid or alkali) that require higher viscosity performance. The product will improve storage stability of the bitumen emulsion. It is recommended to add into the water phase during the soap solution preparation or add directly to the bitumen emulsion and disperse using stirring effect.

**RECOMMENDED DOSAGE:**

0,05 to 0,15% by weight of total emulsion.



CHEMICAL  
MODIFIER



## STEADY



### BITUMEN EMULSION STABILIZER

Flake additive used as a settlement inhibitor in cationic bitumen emulsions that require improved stability both for long storage period or transportation time, utilized as well as viscosity reducer. It is recommended to pour the product directly into the water phase during the soap solution preparation.

**RECOMMENDED DOSAGE:**  
0.05 to 0.30% by weight of total emulsion.



CHEMICAL  
MODIFIER



## SAPO-H33



### WATER PHASE NEUTRALIZER

An acid chemical compound, yellowish liquid product, used in cationic bitumen emulsions to acidify the soap solution. It has to be added directly into the water phase to neutralize the emulsifier thus forming the salt.

**RECOMMENDED DOSAGE:**  
Variable, depending on pH requirements.



CHEMICAL  
MODIFIER



## SAPO-F75



### WATER PHASE NEUTRALIZER

An acid chemical compound, greenish-colorless liquid product, used in cationic bitumen emulsions to acidify the soap solution, as well in Slurry Seal and Micro Surfacing formulations to optimize and achieve faster cohesion between gravel and binder, and therefore anticipate the traffic reopening. It has to be added directly into the water phase to neutralize the emulsifier thus forming the salt.

**RECOMMENDED DOSAGE:**  
Variable, depending on pH requirements.



CHEMICAL  
MODIFIER



## ACID-E



### GREEN BITUMEN ACIDIFIER

New generation vegetal base liquid additive properly studied to increase the bitumen acid index providing better emulsion-ability and consequently prolonged storage stability. Essential in the production of Micro Surfacing and Slurry Seal emulsions, as well as anionic emulsions when low-acidity bitumen is used. Odor-free, heat-resistant product and storage stable when dosed into the bitumen, constituted of renewable natural compounds that avoid any kind of hazardous classification.

**RECOMMENDED DOSAGE:**  
0.5% to 3.0% by weight of bitumen.

# Decorative Pavements & Protective Treatments

-  COLOURED MIX HOT APPLIED
-  COLD APPLIED COATINGS
-  SURFACE PROTECTION



COLOURED MIX HOT APPLIED


COLOR<sup>+</sup> R

 **HIGH-PERFORMANCE RED GRANULAR PIGMENT**

An advanced R&D formulation that optimises the RED hot mix production. It has to be used in combination with neat bitumen or synthetic binders. It is formulated with selected UV-resistant pigments, polymers and additives that provide full dispersion and superior colouring grade. It allows reducing up to 50% the amount of red pigment compared to powder ones, and up to 1/3 less against other granular products. Pelletized product free of clumps, recoverable, water-resistant and easy to dose (10 kg bags or BB).

**RECOMMENDED DOSAGE:**  
 1.8 to 3.0 % by weight of total asphalt mix (with neat bitumen).  
 0.5 to 1.5 % by weight of total asphalt mix (with synthetic binder).



COLOURED MIX HOT APPLIED


COLOR<sup>+</sup> SERIES

 **HIGH-PERFORMANCE GRANULAR PIGMENTS**

Innovative series of different colours and tone pigments that optimises those hot mixtures produced when pavements decorative appearance is requested. Granular pigments have to be used in recipes with synthetic clear binders. The product is made with selected UV-resistant pigments, polymers and additives that provide full dispersion and superior colouring grade. It allows reducing colour dosage compared to other pigments. Pelletized product, clumps free, recoverable, water-resistant and easy to dose (10 kg bags or BB).

**RECOMMENDED DOSAGE:**  
 0.5% to 2.5% by weight of total asphalt mix.



COLOURED MIX HOT APPLIED


CB-S

 **CLEAR BINDER IN GRANULAR FORM**

A neutral colour pigmentable synthetic pellet binder that replaces the bitumen in hot mixtures produced when pavements decorative appearance is requested. It is formulated with selected UV-resistant compounds and its use minimises potential colour changes. Product 'ready to use', it is added at room temperature directly to the hot mix plant pug mills. Its addition could be done both manually (weighted melting bags) or through pneumatic dosing devices. It melts immediately when in contact with hot aggregate into the mixer. It achieves maximum colorimetric performance when used in combination with COLOR+ Series.

**RECOMMENDED DOSAGE:**  
 Similar to standard bitumen.



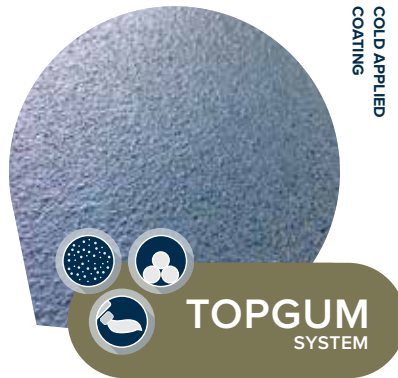
COLD APPLIED COATING

**BOND SYSTEM**

**HIGH-PERFORMANCE DECORATIVE COATING**

Innovative solution for multi-layer color coatings. Specifically designed to overlay asphalt or concrete substrates characterized of multiples textures (dense, rough or stamped). It provides decorative appearances while reinforcing the surface upper layer and enabling to traffic. It will act against asphalt micro-deformations and tensional strains, providing flexibility, durability, waterproofing and skid resistance. A combinable dynamic system that favors coating in a multitude of finishes, textures and colors.

**RECOMMENDED DOSAGE:**  
> 1.0 kg/m<sup>2</sup>, depending on texture and layers to be applied.



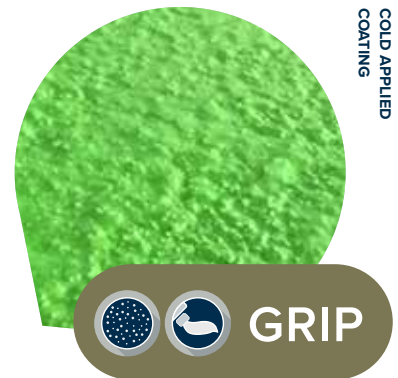
COLD APPLIED COATING

**TOPGUM SYSTEM**

**HIGH-FLEXIBLE SURFACE COATING**

Innovative solution for waterproofing membranes and multi-layer color coatings when quick reopening to traffic is required. Extremely durable 2-components premium surface treatment that provides antiskid properties and high abrasion resistance. Thanks to its high-flexible behavior, it is able to resist higher micro-deformations and tensional pavement displacements, even at extremely low temperatures (≤-30°C). It is recommended as decorative solution for high trafficated areas. The product is already supplied colored.

**RECOMMENDED DOSAGE:**  
Follow TDS indications.



COLD APPLIED COATING

**GRIP**

**ANTISKID SURFACE COATING**

An extremely durable 2-components color surface treatment that provides antiskid properties and high abrasion resistance. Thanks to its flexible behavior it is able to resist to micro-deformations and tensional pavement displacements, even at extremely low temperatures (≤-30°C). It is recommended as decorative solution for high traffic areas. The product is already supplied colored, including texture aggregates inside.

**RECOMMENDED DOSAGE:**  
Follow TDS indications.



COLD APPLIED COATING

**GLOW RANGE**

**GLOW IN THE DARK FLOORING EFFECTS**

Innovative solutions range for special photo-luminescent effect coatings, offering surface light emissions after UV absorption. Coatings, marking systems and synthetic aggregates with high PSV (1 to 22 mm), in different color effects, ideal for concrete and flooring applications, where high abrasion resistance is needed. Combinable with dynamic systems to protect and favor coating effect and a multitude of finishes and textures.

**RECOMMENDED DOSAGE:**  
Follow TDS indications.



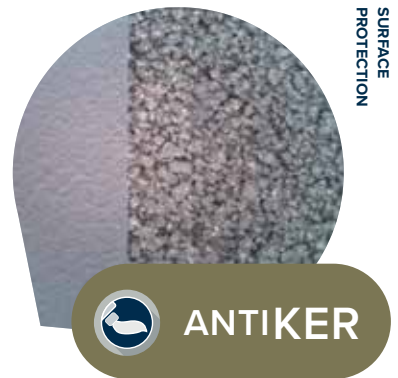
COLD APPLIED COATING

**SEAL**

**COLOURED SYNTHETIC COATING**

A coloured, skid resistance surface treatment, used as a decorative finishing. A mortar, composed of a mixture of synthetic resins, pigments and selected mineral fillers. Its application aim is decorative and as information signalization for road end users. It is applied in traffic-free areas such as footpath, cycle lanes, pedestrian areas, sports tracks and parks. Product 'ready to use' available in different colours.

**RECOMMENDED DOSAGE:**  
> 1.5 kg/m<sup>2</sup>, depending on texture and layers to be applied.



SURFACE PROTECTION

**ANTI KER**

**COLOURED ANTI-KEROSENE PROTECTIVE COATING**

High-performance asphalt pavement protective coating, which releases great skid resistance, waterproofing, and fuel spilling protection to the surface. To be applied at ambient temperature over bituminous pavements. It is the ideal solution for gas stations, bus lanes, car parking lots and airport aprons or over any surface liable to suffer fuel spillage. Product 'ready to use' available in different colours.

**RECOMMENDED DOSAGE:**  
> 1.5 kg/m<sup>2</sup>, variable depending on texture and layers to be applied.



SURFACE PROTECTION



STAB-33

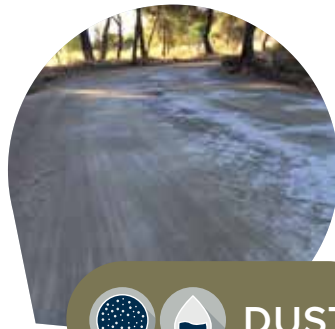


### SOIL STABILISER

Very reactive and hydrophobic additive, which improves unbound surfaces load bearing capacity and mechanical behavior when added to soil in stabilization applications. The material is delivered as a dry powder to be diluted in water on site. Recommended for clay and silts soil treatments. It provides to the surface treated a waterproof lay perfectly suitable for footpaths, bike tracks, natural areas or roadways with low to medium traffic intensity.

**RECOMMENDED DOSAGE:**

0.50 to 1.50 kg/m<sup>2</sup> (not diluted); variable, depending on the substrate characteristics.



SURFACE PROTECTION



DUST

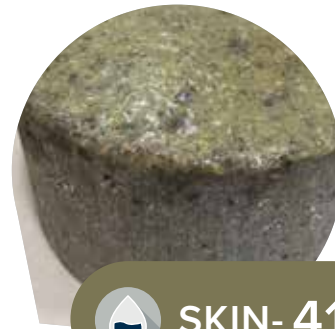


### SOIL DUST SUPPRESSOR

Binding additives to be applied on soil dusty surfaces. Suitable to use on unbound surface pavements. Excellent binding and waterproofing effects that improve performances in footpaths, cycle tracks, natural areas or roadways with low to medium traffic intensity. Solid grade is supplied highly concentrated to be dissolved on site. Liquid version available to be diluted on site.

**RECOMMENDED DOSAGE:**

Solid grade 0.250 kg/m<sup>2</sup> (not dissolved).  
Liquid grade 0.033 kg/m<sup>2</sup> (not diluted)



SURFACE PROTECTION



SKIN- 41

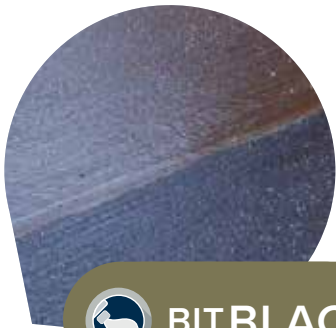


### SOIL PROTECTOR

Colorless surface sealer based on synthetic resins and solvent-free, which confers strength to the up layer increasing its resistance to abrasion and therefore its durability, permitting traffic on it. It is used to prime natural soil ensuring great chemical and mechanical resistances to treated pavements.

**RECOMMENDED DOSAGE:**

It is typically dosed in 0.45 Kg/m<sup>2</sup> to treat 5-10 mm depth of soil.



SURFACE PROTECTION



BITBLACK



### BITUMINOUS SLURRY

Black bituminous coating with mortar consistency, composed of bitumen emulsion and selected mineral fillers. It is applied to preserve and protect the underlying pavement structure and provide a new even surface. Applied, as well, as final surface coating in car parking lots, cycle lanes, etc.

**RECOMMENDED DOSAGE:**

> 1.5 kg/m<sup>2</sup>, depending on existing pavement texture and layers to be applied.



SURFACE PROTECTION



PERCOLA



### PERCOLATE TOPPING





Special dry mortar composed by hydraulic binder, synthetic resins, additives and mineral charges, used to create hybrid surface pavements providing durable and wear resistant performance. Based on open-grade asphalt mix where the voids are filled with an high-strength cement slurry. Combine the asphalt pavement flexibility behavior with hydraulic pavement stiffness, offering high resistance to shearing forces and puncture. To be applied when high load conditions are requested as airport ramps, bus lines, parking areas, petrol station, tunnels and industrial floorings. It confers a continuous (jointless), anti-kerosene and high puncture resistance pavement.

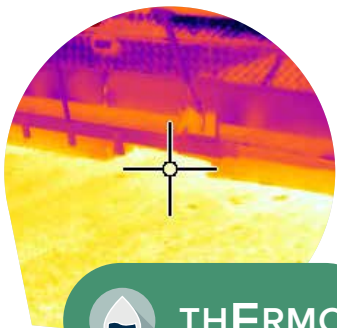
**RECOMMENDED DOSAGE:**

1.5 to 2.0 kg/m<sup>2</sup> (not diluted) for every 1 cm of thickness, depending on existing asphalt mix void content.




# Environmental Solutions

-  **WARM MIX ADDITIVES**
-  **RELEASE AGENTS & CLEANERS**
-  **RECLAIMED ASPHALT PAVEMENTS**
-  **FUMES ABATEMENT PRODUCTS**



WARM MIX ADDITIVE



**Thermo<sup>+</sup>**

 **GREEN ADDITIVE FOR WARM MIX ASPHALT**

A new generation vegetal base liquid additive with tensioactive properties that allows the production of warm mixes, dropping down production temperatures to 110°C (230°F) and laying and compaction temperatures to 90°C (194°F). It reduces fuel consumption and emissions. It provides health and safety benefits to machinery operators at workplace. Even in cold weather conditions it allows longer distance hauls. Fume-free solution for indoor applications. Odor-free, heat-resistant and storage stable when added into the bitumen. It improves aggregate-binder adhesion. Its natural compounds formulation prevents hazardous label.

**RECOMMENDED DOSAGE**  
0.3% to 0.5% by weight of bitumen (~1.0% for extreme temp. reductions).



WARM MIX ADDITIVE



**BITFOAM**

 **FOAMING AGENT**

Liquid additive that enhances binder foaming properties in expanded bitumen applications. It increases the values of the 'Expansion Ratio' and 'Half Life' even with low bitumen operation temperatures. Particularly formulated to compensate the effects of chemical products incorporated during bitumen refining process. It also provides adhesion between aggregates and bitumen due to own surfactant property. Compatible with all bitumen grades, it has to be added into the binder tank ensuring slight agitation or recirculation.

**RECOMMENDED DOSAGE**  
0.40% to 0.70% by weight of bitumen.



WARM MIX ADDITIVE

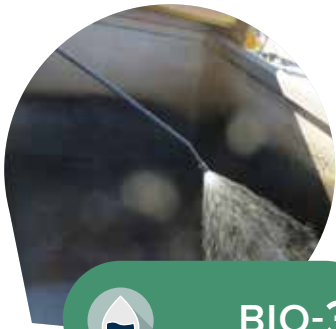


**w-111**

 **ADDITIVE TO IMPROVE WORKABILITY**

A synthetic polyolefin wax additive that modifies the bitumen rheology and rises workability properties of the mix, acting on decrease of its viscosity (at high temperatures). These characteristics allow dropping down production and laying temperatures to <30°C (<54°F) thus considerably reducing fuel consumption and emissions in the atmosphere. It allows longer distance hauls and to extend working season to winter. It immediately disperses when poured into the bitumen.

**RECOMMENDED DOSAGE:**  
1.5% to 3.0% by weight of bitumen.



RELEASE AGENT  
& CLEANER



**BIO-3**



**GREEN ASPHALT  
RELEASE AGENT  
(PLANT APPLICATION)**

New generation and environmental friendly water-soluble release agent, chemically constituted of renewable vegetal sources. It replaces the use of diesel and hydrocarbon derivatives, providing an antisticking barrier between asphalt mixtures and iron elements. Mainly used in asphalt plant applications for truck bed, wagons, showels, etc. Readily biodegradable, it does not contain solvents, non-flammable and it doesn't evaporate that fast even when applied onto hot parts.

**RECOMMENDED DOSAGE**

Apply in a dilution of 1:7 water (truck bed).



RELEASE AGENT  
& CLEANER



**BIO-6**



**GREEN ASPHALT  
RELEASE AGENT  
(JOB SITE APPLICATION)**

New generation and environmental friendly pure release agent, chemically constituted of renewable vegetal sources. It replaces the use of diesel and hydrocarbon derivatives, providing anti-sticking barrier between asphalt mixtures and iron elements. Mainly used in job site applications for machinery and tools (paver, shuttle boogey, shovels, etc). Readily biodegradable, water insoluble, it does not contain solvents, non-flammable and it doesn't evaporate that fast even when applied onto hot parts.

**RECOMMENDED DOSAGE:**

Apply pure and atomized.



RELEASE AGENT  
& CLEANER



**BIO-7**

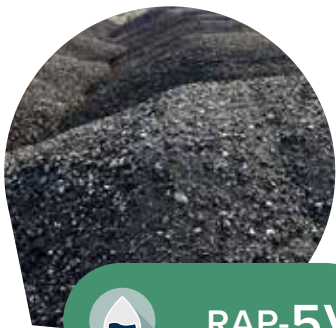


**GREEN ASPHALT  
CLEANING AGENT  
(WORKSHOP)**

New generation and environmental friendly cleaning agent (strong), chemically constituted of renewable vegetal sources. It replaces the use of hydrocarbon solvent derivatives. Mainly used in cleaning and maintenance works. Readily biodegradable, water insoluble, it does not contain solvents, non-flammable and remain liquid at low temperatures. It is very appropriate for cleaning and degreasing tasks.

**RECOMMENDED DOSAGE:**

Apply pure and atomized.



RECLAIMED ASPHALT  
PAVEMENT



**RAP-5V**



**GREEN  
REJUVENATOR**

A new generation vegetal base liquid rejuvenator formulated to produce hot mixes with high amount of RAP/RAS, without using softer binders or thinners. It helps to recover the original properties of the oxidised and aged RAP bitumen. Its use is aligned to standard EN 13108-8 'Recycled bituminous Mixture'. Odor-free, heat-resistant and storage stable when added into hot bitumen. Formulated with renewable natural compounds that avoid any kind of hazardous classification.

**RECOMMENDED DOSAGE**

0.10 to 0.15% by weight of RAP/RAS content.



FUMES ABATEMENT  
PRODUCT



**ODOUR**



**BITUMEN ODOUR  
SUPPRESSOR**





Liquid odor eliminator additive specifically formulated to remove the broad spectrum odor emissions produced by asphalt hot applications (organic and inorganic), which makes its use pretty proper in location close by residential areas. Non-toxic, biodegradable product and heat-resistant. It is dosed into the bitumen tank at refineries, terminals and hot mix plants.

**RECOMMENDED DOSAGE**

0.01% to 0.03% by weight of bitumen.



# Miscellaneous

-  ROAD MAINTENANCE
-  WATER PROOFING
-  LAB CHEMICALS
-  BITUMINOUS BINDERS



ROAD MAINTENANCE



**FLEX**

## HOT APPLIED CRACK SEALANT

High polymer modified bituminous mastic, manufactured with additives and selected mineral fillers. It is a thermo-elastic material expressly formulated to seal and fill cracks and joints in concrete or bituminous pavements (Type N2). It is supplied as a solid product in cardboard box with protective silicon film that allows easy handle to feed the melting pot. Hot applied on all types of pavements: airports, motorways, secondary roads and expansion joints.

### RECOMMENDED DOSAGE

Variable, depending on the joint or crack dimensions.



ROAD MAINTENANCE



**MAFE**

## POTHOLE PATCHING READY MIX

Cold pothole patching material prepared with high-quality 4 - 6 mm size aggregates and bituminous binder. Product "ready to use" supplied in 25 kg plastic buckets or bulk; herefore it doesn't need to be reheated during patching process. Its usage is recommended for road maintenance to fix potholes, manholes and for small pavement rehabilitations, especially recommended to fill pipes or cables tracks.

### RECOMMENDED DOSAGE

25 kg of product cover a surface of 1 m<sup>2</sup> (between 1 and 2 cm in depth).



ROAD MAINTENANCE



**E-COLD**

## GREEN ADDITIVE FOR COLD MIX PRODUCTION

A new generation vegetal base liquid additive, ideal for pothole patching cold mix production, utilized for road maintenance, cracks sealing or cables/ pipes tracks filling. It releases plastic properties and good workability to the pothole patching mixes (bulk or bagged material). It can be used with 4-7 mm or 5-8 mm aggregates and 70/100 or 50/70 bitumen, enabling the mix storage for several months. Non-flammable and readily biodegradable, it is characterized by a peculiar smell. It is VOC and tar/mineral oils free.

### RECOMMENDED DOSAGE:

15% to 23% by weight of bitumen (depending on the bitumen grade and required workability).





WATER  
PROOFING



**PROOF**  
RANGE

## WATERPROOFING SOLUTIONS

Comprehensive range of below and above-ground waterproofing product systems (bituminous paints, primers, mortars, sealers) manufactured to the highest quality standards. Whether your structure will be affected by rainwater, groundwater or contaminants contained within the ground soil, these products can provide system solutions to meet these demands. Ready to use products for industrial flooring, building construction and protective structures such as basements, foundations and retaining walls, columns and vertical surfaces, vapor barrier, horizontal surfaces, watertight sealing, bonding for bitumen membranes. Available in several grades and packaging, based on different consistencies and recipes.

### RECOMMENDED DOSAGE:

Variable, depending on application.



LAB  
CHEMICALS



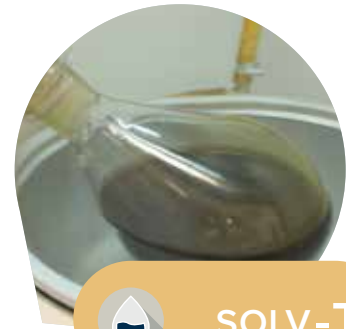
**SOLV-P**

## CHLORINATED SOLVENT

A colorless, non-flammable, liquid product used in laboratory as a bitumen solvent for testing procedures such as 'Bitumen Recovery: Fractionating Column' (EN 12697-4) or 'Soluble binder content' (EN 12697-1).

### RECOMMENDED DOSAGE

Variable, depending on the test procedure.



LAB  
CHEMICALS



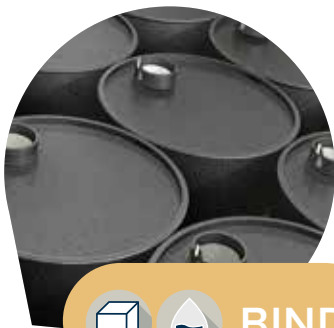
**SOLV-T**

## AROMATIC SOLVENT

An aromatic hydrocarbon liquid organic solvent, normally used in laboratory asphalt testing procedures such as 'Determination of solubility (EN 12592)', 'Determination of the paraffin wax content. Method by extraction (EN12606-2)' or 'Bitumen chemical composition, Corbett chromatography'.

### RECOMMENDED DOSAGE:

Variable, depending on the test procedure.



BITUMINOUS  
BINDERS



**BIND**

## BITUMEN BINDERS

Bituminous materials delivered at room temperature (standard bitumen, polymer modified bitumen and bitumen emulsions) used for different purposes on Paving and Waterproofing industries. These products are obtained by a process that guarantees their excellent quality and performances. Offer different grades according to international standards and classifications based on penetration, viscosity (AC) and performance grade (PG). Packaged products (solid consistency), as an efficient and practical solution, optimizing transportation and storage costs, improving supply operations in geographically difficult locations.

### RECOMMENDED DOSAGE:

Variable, depending on final application.



# Technical & Service Support



## LABORATORY ASSISTANCE

Thanks to his expertise and to high qualified asphalt pavement team, Ravago Chemicals offers a full service as per laboratory professional assistance and Standards appliance to those companies who are facing new technologies and applications in the field of asphalt industry, guiding them, step by step, to reach their planned targets and become more familiar with the use of new products. Moreover, a multi annual on-going relationship with different Roads Associations and Universities will grant to our customers the access to last generation asphalt mixes and bitumen research and control laboratory equipment, to develop their company technology degree up to level.



## ON-SITE TECHNICAL ASSISTANCE

Ravago Chemicals is proud to assert that senior pavement experts and engineers have nowadays all the proficiency and capability to help out our customers directly on site, for any road construction and maintenance project, being able to instruct client's staff on start up for any emulsion, PMB, and hot mix plant, as well as supporting in cold applied bitumen emulsion technologies such as: Micro and Slurry applications, cold recycling both in site and in plant, and pothole patching systems.



## DOSING EQUIPMENT

Increasingly, new asphalt technologies require full automation of dosing system units: injection of liquid additives into bitumen, addition of pelletized products into pug mills of batch hot mix plants or directly into continuous drum mixers; as well as reliable metering and weighing systems that should grant to minimize dosing errors and be able to report a back list of the products effectively dosed in the plants. After several years of experience in this industry Ravago Chemicals has chosen a list of reliable dosing systems manufacturers and suppliers, to whom our customer could give credit to be guaranteed to equip their plants with the most appropriate solution.



### KNOW-HOW

Ravago Chemicals in last 2 decades has been working and investing important resources in developing new asphalt solutions, researching and formulating a variety of chemicals, ready to satisfy the demand of technical level enhancement of the asphalt industry. New improved laboratories, continuous staff knowledge and skills upgrading and participation to most important congresses in construction field, had become our mission and commitments facing towards our customers. Ravago Chemicals is now ready to share this know-how with his reputed business partners.



### TAILOR-MADE PACKAGING

Thanks to our extensive facilities and professional service team, we are able to adapt the Ravasol packaging (solid or liquid) in order to match the customer requirements. Additives are produced, stored or delivered meeting Standards and official regulations, to ensure the maximum quality and protection till its use. Ravasol Asphalt TDS informs about the regular packaging format supplies for our solutions: IBC, drum, bulk, bucket, box, can, heating systems, BigBag, bag,... Due optimized and flexible processes, we can provide tailor-made packaging to satisfy our customers needs.



### GLOBAL LOGISTIC CAPABILITIES

Adding value to our customers with our export capacity to deliver Ravasol products worldwide (by land, sea & air), using own experienced and technical logistics network forces. Offices and warehouses in most of the European countries, Africa, North-America and official Asphalt distributors in Latin America, Ravago Chemicals has established a commercial network with high service level and local presence. We are long term oriented company.



For more information, please contact us at:

[www.ravagochemicals.com](http://www.ravagochemicals.com)

ASP-20-B

