FIELD GUIDE
TO EMULSIONS

ERGON

12TH EDITION

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Preface

We at Ergon Asphalt & Emulsions hope you will find this handbook useful in your daily efforts in the areas of pavement preservation, maintenance, rehabilitation and construction. It is intended to be a simple guide and a quick reference to asphalt emulsions and their uses.

Asphalt emulsions have been used throughout the world for well over 50 years. In the early days, emulsions served as a solution to the problem of delivering asphalt at a usable temperature to remote locations. It was quickly recognized that the use of water as a carrier for asphalt had other distinct advantages. Emulsions expanded the types of materials that could be used and are much safer than hot or “cutback” products. Mixing asphalt with aggregates was easier, and the water phase carried the asphalt deep into cracks and crevices of a pavement surface that would have otherwise been left vulnerable to the elements.

Every year the criterion of material selection is changing. The benefits and flexibility of asphalt emulsion products continue to emerge. A responsible awareness of the roadway construction and maintenance industry’s environmental impact, combined with the necessity of a healthy economy, demands we be less wasteful of our natural resources, more conscious of worker and user safety, and that we strive to efficiently manage limited taxpayer dollars.

If you are planning to use an asphalt emulsion product, we encourage you to use this handbook. Consider it an introduction to the vast knowledge and technology available to you from our industry. In the following pages, the many different grades of emulsions and their uses are outlined, storage and handling issues are discussed, and you will find various conversion tables as well as other useful information. We hope you find this handbook very helpful, but as always, we encourage you to contact your local sales representative to address your individual needs.

ERGON

Asphalt Emulsion Defined

What is an asphalt emulsion?
Asphalt emulsion is a combination of three basic ingredients: asphalt, water and a small amount of an emulsifying agent. These components are introduced into a colloid mill that shears the asphalt into very small droplets. The emulsifier, a surface-active agent, keeps the asphalt droplets in a stable suspension. The result is an asphalt-based product with a consistency ranging from that of milk to that of heavy cream, which can be used in cold processes for road construction and maintenance.

Why use asphalt emulsions?
Asphalt emulsions do not require a petroleum solvent to make them liquid, and, in most cases, they can be used without additional heat. Both of these factors contribute to energy savings. Additionally, asphalt emulsions offer great flexibility in their application since they offer the end user a variety of characteristics not found in other paving and maintenance materials. Asphalt emulsions are environmentally friendly. There are little to no hydrocarbon emissions created with their use.

Are asphalt emulsions new?
Asphalt emulsions were first manufactured in the early part of the 20th century, and today, they are used internationally. The use of asphalt emulsions is growing, and 10%-20% of all asphalt is used in the form of asphalt emulsions.

How are asphalt emulsions classified?
Asphalt emulsions are classified into three categories: anionic (negative charge), cationic (positive charge) or nonionic (no charge). The anionic and cationic classes refer to the electrical charges surrounding the asphalt particles.

The absence of the letter "C" denotes anionic emulsions. Asphalt emulsions are further classified on the basis of how quickly they coalesce; i.e., revert to asphalt cement. The terms RS (Rapid Set), MS (Medium Set), SS (Slow Set) and QS (Quick Set) have been adopted to simplify and standardize this classification. Additionally, trailing numbers are used to delineate the relative viscosity of the emulsion, and the letters "H" and "S" indicate whether hard or soft base asphalt is used to make the asphalt emulsions. Thus, a CSS-1H is a cationic slow-set emulsion with a relatively low asphalt emulsion viscosity made with hard base asphalt.

Do asphalt emulsions have any uses around the home?
Driveway sealers, roofing repair materials, caulks and mastics may contain specially formulated asphalt emulsions.

What chemicals are present in the emulsion?
The main components of the emulsion are asphalt (bitumen) and water. Emulsions typically contain between 55% and 75% asphalt. In addition to the asphalt and water, asphalt emulsions contain, on average, less than 3% of an emulsifier by weight of emulsion, or "soap," which functions to stabilize the emulsion. These soaps are similar in nature to the soaps and detergents used in household cleaning and personal care. The asphalt emulsions may also contain trace amounts of other ingredients such as pH (acidity) regulators and viscosity regulators.

Tell me more about the emulsifying agents.
The most common products are fatty acids and lignins derived from wood; these form soap by reacting with sodium hydroxide. The soaps become negatively charged in water and produce "anionic" asphalt emulsions. Another class of emulsifiers, amines, are derived from wood acids

(tall oils) or animal fats (tallow). These emulsifiers form soaps that become positively charged in water and produce "cationic" asphalt emulsions.

How do they work?
When asphalt emulsion is mixed with or exposed to the aggregates used in roadway applications, the emulsion is destabilized, and the droplets of asphalt fuse together, providing a strong adhesive bond to "glue" the aggregates together. The water evaporates, but the emulsifiers remain in the asphalt, where they perform a valuable function in helping the asphalt adhere to the aggregate.

Chip Seal Defined

What is a chip seal?
Chip seals are the most widely used pavement preservation method. Chip seals renew weathered pavements, improve friction, and seal and protect the underlying road surface. While the single surface treatment is the most commonly referenced, there are many types of chip seals, including singles, doubles, triples, sandwich, inverted, racked in, etc. Each has a different construction technique and is chosen for a particular purpose.

How is a chip seal applied?
Potholes are repaired, and any large cracks greater than 1/4" in the road surface are sealed. Sufficient curing of these repairs is allowed before applying the chip seal. The road surface is then cleaned using a power sweeper or rotary broom. For a conventional treatment like a single course chip seal, an asphalt emulsion is then uniformly spray-applied by an asphalt emulsion distributor, and aggregates (chips) are evenly applied with a self-propelled or truck-attached mechanical spreader. A pneumatic tired roller is then used to embed the aggregate into the asphalt film. After initial cure, excess aggregate is removed by brooming. After the chip seal treatment has cured completely, the surface may be swept again and striping applied.

What types of asphalt emulsions are used for chip seals?
Typical asphalt emulsions used in chip seals are CRS-2, RS-2 and HFRS-2. For higher volume traffic roadways, polymer modified versions of these asphalt emulsions, like CRS-2P and CHFRS-2P, are used. *See your state's Product Locations & Applications page for more options.*

What are some keys to a successful chip seal surface treatment?
- Coordinate construction to ensure continuous operation
- Use hard, cubical and clean aggregate
- Properly calibrate application equipment
- Maintain traffic control while chip seal application cures

Surfacing Types

What is slurry surfacing?
Slurry surfacing is a thin, cold-mixed pavement preservation treatment composed of asphalt emulsion, aggregate, water and mineral filler. There are two basic products, slurry seal and micro surfacing. Slurry seal is typically applied on residential streets, airport roadways, sidewalks and parking lots. Micro surfacing is a premium product based on specially selected aggregates and polymer modified asphalt emulsion. Micro surfacing is designed to be applied in thicker lifts for high-traffic areas requiring heavier application rates and a quick return to traffic. Micro surfacing is also used as a rut fill treatment.

How is a slurry seal or micro surfacing applied?
The raw materials are combined in a mobile mix unit. The slurry surfacing is applied to an existing pavement surface by means of a spreader box linked to the mixing unit. The slurry is introduced into the spreader box and is "laid down" as the mixing unit is driven forward.

What type of asphalt emulsion is suitable?
Slurry seal may use a variety of emulsions such as SS-1H or CQS-1H. Micro surfacing always uses a cationic polymer modified emulsion such as CSS-1HP or CQS-1HP. The emulsion type is selected on the basis of local specifications and through a laboratory mix design process, composed of tests on the compatibility of the aggregate and the emulsion, and on the durability of the cured seals. *See your state's Product Locations & Applications page for more options.*

Tack Coats & Primes

What is tack coat?
Tack coat (also known as bond coat) is a light application of asphalt emulsion between hot mix asphalt layers designed to create a strong adhesive bond used to prevent slippage. Heavier applications may be used under porous layers or around patches where it also functions as a seal coat.

Why use tack coat?
Without a tack coat, the asphalt layers in a roadway may separate, which reduces the structural integrity of the pavement and may allow water to penetrate the structure.

What type of emulsion should be used for tack coats?
The type of emulsion used for tack coats varies from country to country. Normal practice in the USA is to use a slow-setting emulsion that is diluted with water before application. Cationic rapid-setting, cationic quick-setting or specially designed, less tracking emulsions that are applied undiluted are becoming more popular. *See your state's Product Locations & Applications page for more options.*

Why use prime coat?
Prime coats protect the integrity of the granular base during construction and help reduce dust. In the case of a base that is to be covered with a thin hot mix layer or a chip seal for a low-volume roadway, priming ensures a good bond between the seal and the underlying surface, which otherwise would have a tendency to delaminate.

Why use asphalt emulsion prime?
Compared to cutback asphalt primes, emulsion primes are more environmentally friendly. Solventless prime coats are available in some areas. *Check your state's Product Locations & Applications page for availability.*

What type of emulsion is most suitable for emulsion prime?
Slow-setting grades of asphalt emulsions (diluted with water before application) are suitable. To ensure good penetration on dense granular or stabilized bases, the surface may need to be scarified and dampened before application of the emulsion. *See your state's Product Locations & Applications page for more options.*

Emulsion Recycling

How are asphalt emulsions used in recycling applications?
Cold in-place recycling (CIR), hot in-place recycling (HIR) and full depth reclamation (FDR) are three of the most common applications that use asphalt emulsion as the binder that mixes with pulverized and reclaimed pavement to create a new base course.

What is cold in-place recycling?
CIR is a treatment used to rejuvenate flexible hot mix asphalt roads. Initially, a milling machine processes 3-5 inches of the existing surface layer. The milled material is further crushed or used as is and compacted into the desired size for the project during the gradation control process. Virgin aggregate can be added during this process if necessary. Afterward, a binding additive is mixed with the graded material, and the resulting mixture is placed over the remaining pavement structure. The recycled mix is then compacted to the specified density.

What is hot in-place recycling?
HIR is a rehabilitation treatment used to rejuvenate deteriorated bituminous pavements. HIR is a continuous process that can be completed in a single pass. It works by heating the top 1-2 inches of existing asphalt until it is pliable, scarifying the pavement, removing the material and supplementing it with a small amount of new hot mix or binder, such as rejuvenating emulsion, then placing the mix over the remaining roadway structure. The recycled material is then compacted using traditional roller operations.

What is full depth reclamation?
FDR is a rehabilitation technique in which the full thickness of the asphalt pavement and a portion of the underlying aggregate base is uniformly pulverized and blended to provide an upgraded, homogeneous material.

What is the difference between CIR/HIR and FDR?
CIR pulverizes the existing pavement to a depth of 3-5 inches. HIR processes the top 1-2 inches of the surface. FDR pulverizes to a greater depth than either of these other treatments, reaching below the existing pavement into the underlying material to produce a stabilized base course.

What are the advantages of recycling?
Energy is conserved as the construction is completed in-place/on-grade, and little or no fuel is required for heating. Reflective cracking can be reduced with CIR/HIR and eliminated by FDR. Another advantage is the potential for reduced project costs and completion time associated with using recycled materials and less energy and fuel. Additionally, the pavement crown and cross slope can be restored, and loss of curb height is reduced or eliminated.

Are there benefits to using asphalt emulsion?
Yes. In fact, there are significant benefits when using asphalt emulsion as the stabilizer, including a fast return to traffic and the creation of a crack-resistant flexible base, which increases resistance to moisture intrusion and helps reduce highway maintenance costs. Asphalt emulsion also allows for better coating of the recycled materials. Specifically for FDR, further benefits include less water use and the creation of much less dust. This results in significant environmental impact reduction and greatly increases project safety issues relating to construction workers and the traveling public.

Emulsion Mixes

What is the difference between dense-graded and open-graded emulsion mixes?
Dense-graded mixtures contain aggregate that has been selected to include fine material and filler; therefore, the compacted mixture has low air voids and is essentially impermeable to water. Open-graded mixtures contain aggregate without the fine fractions, and when compacted, have high voids and are permeable to water. Because of its high fines content, the aggregate in dense-graded mixes is generally more reactive toward asphalt emulsion and demands a slower-setting grade than open-graded mixtures.

Why should I use cold emulsion mix rather than hot mix?
Cold mixes use less energy and produce fewer emissions than hot mixes. Cold mix plants are less expensive to operate, simpler to use and are more mobile than hot mix plants; emulsion mixes also lend themselves to on-site and in-place manufacturing. The ability to stockpile cold mix material for future use leads to less waste and reworking than with hot mix.

How should I select the emulsion for cold mix?
Emulsion selection is on the basis of laboratory mix designs. Mix designs ensure that the emulsion is compatible with the aggregate and that the mixture is durable. Slow-setting emulsions are generally used for dense mixes, and medium-setting emulsions for open-graded mixes. The emulsion formulation can be adjusted, if necessary, to best suit the aggregate and application.

The eSeries

Ergon Asphalt & Emulsions' exclusive eSeries products are designed for use in pavement preservation and maintenance applications to ensure optimal road performance. These products have been tested and proven to provide significant performance improvements over their conventional counterparts. Products include eFog, eFog HP, eFlex, eFlex ES, eScrub, ePatch, ePrime, eTac and eTac HB.*

What is eFog Rejuvenating Fog Seal?
eFog is a rejuvenating fog seal developed to correct more severe distresses than a conventional fog seal — offering extended life cycles for open-graded friction courses, dense-graded hot mix surfaces and aged chip seal surfaces. In addition to preventing raveling, eFog's unique polymer modification provides more dense film thickness for increasing durability and resistance to tracking. Its darker color makes striping more visible, increasing driver safety.

What is eFog HP High-Performance Fog Seal?
eFog HP is Ergon's high-performance fog seal emulsion and the sister product of eFog rejuvenating fog seal. This product helps lock down aggregate on newly chip sealed surfaces, prevents raveling and delays aging on dense-graded hot mix surfaces. Additionally, eFog HP's trackless and quick-breaking properties facilitate a faster return to traffic following application than a conventional fog seal.

What is eFlex Premium Micro Surfacing?
eFlex premium micro surfacing is significantly tougher than conventional micro surfacing systems due to its increased level of polymer modification. eFlex provides a higher degree of tolerance to extreme temperatures as well as protection against distress typically seen soon after conventional micro surfacing applications. This includes damage caused by exposure to passenger and utility vehicles, including snowplows. It can be applied using **Type II** and **Type III** aggregate and is suitable for use on all road types.

What is eFlex ES Premium Slurry Seal?
eFlex ES premium slurry seal is designed for residential streets, cul-de-sacs, city arterials and collectors. With increased levels of polymer modification, eFlex ES is significantly tougher than conventional and modified slurry seals. It provides increased durability and resistance to damage caused by exposure to extreme temperatures and passenger and utility vehicles, including snowplows. It can be applied using **Type I, Type II** and **Type III** aggregate.

What is eScrub Rejuvenating Scrub Seal?
eScrub is a rejuvenating scrub seal designed as a mass crack sealer to correct moderate to severely cracked roads. It renews surface friction and increases overall pavement quality. eScrub is a far less costly alternative to traditional remove-and-replace methods, and it can be used as a stress absorbing interlayer as well as the first course of a cape seal.

What is ePatch High-Performance Cold Mix?
ePatch is a high-performance cold mix that offers increased durability over conventional cold mix products. The advanced formulation ensures patches stay fixed longer and require less maintenance. ePatch stays mobile for months, extending stockpile life and allowing continued use over time and projects. ePatch can be produced at a hot mix plant or via a pugmill operation.

What is ePrime Eco-Friendly Prime Coat?
ePrime is an environmentally friendly, solvent-free (no VOCs) prime coat developed to safeguard the road base from moisture during the construction phase, its most vulnerable period. A quick cure allows for same-day paving as opposed to the 3- to 5-day waiting period required after a traditional prime coat application.

What is eTac Trackless Bond Coat?
eTac is a premium bond coat emulsion that is storage stable and provides excellent compatibility between pavement layers, creating a strong, long-lasting bond. eTac's trackless quality makes it an extremely user-friendly bond coat of choice, and it can be applied at normal to high shot rates.

**eTac HB is Ergon A&E's hot-applied trackless asphalt bond coat and sister product of the eTac emulsion. Both products are designed to optimize production and reduce cleanup efforts during and after construction.*

Notes

Alabama

AL

Alabama Product Applications

Birmingport

Treatment	Products
Bond Coat/Tack Coat – Trackless	BC-1HT (eTac)
Chip Seal – Conventional	CRS-2
Chip Seal – Modified	CRS-2P
Fog Seal – High Performance	EF-1H (eFog HP)
Hot Applied Trackless Bond Coat	eTac HB
Rejuvenating Scrub Seal	CMS-1PC (eScrub)
Tack Coat – Conventional (Novabond)	CQS-1HP

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Notes

Arizona

AZ

Arizona Product Applications

Chandler

Treatment	Products
Bond Coat/Tack Coat – Trackless	BC-1HT (eTac)
Rejuvenating Scrub Seal	CMS-1PC (eScrub)
Chip Seal – Conventional	CRS-2H, CRS-2
Chip Seal – Modified	CRS-2HLM, CRS-2P
Cold In-Place Recycling	CIR-EE
Fog Seal – Rejuvenating	CMS-1PF (eFog)
Fog Seal – Specialty	PMRE
Full Depth Reclamation	FDR-EE
Micro Surfacing – Conventional	MSE, CQS-1HP, PMCQS-1H
Micro Surfacing – Premium	CSS-1EP (eFlex)
Prime Coat – Solventless	CPP-1 (ePrime)
Slurry Seal – Conventional	CQS-1H
Slurry Seal – Modified	LMCQS-1H
Spray Paver Application	PMEM
Tack Coat – Conventional	CSS-1H, SS-1H

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Notes

Arkansas

AR

Arkansas Product Applications

Little Rock

Treatment	Products
Bond Coat/Tack Coat – Trackless	BC-1HT (eTac)
Chip Seal – Conventional	CRS-2
Chip Seal – Modified	CRS-2P
Fog Seal – Conventional	CSS-1, CSS-1H
Fog Seal – High Performance	EF-1H (eFog HP)
Prime Coat – Solventless	CPP-1 (ePrime)
Tack Coat – Conventional	CSS-1, CSS-1H
Spray Paver Application	PMEM

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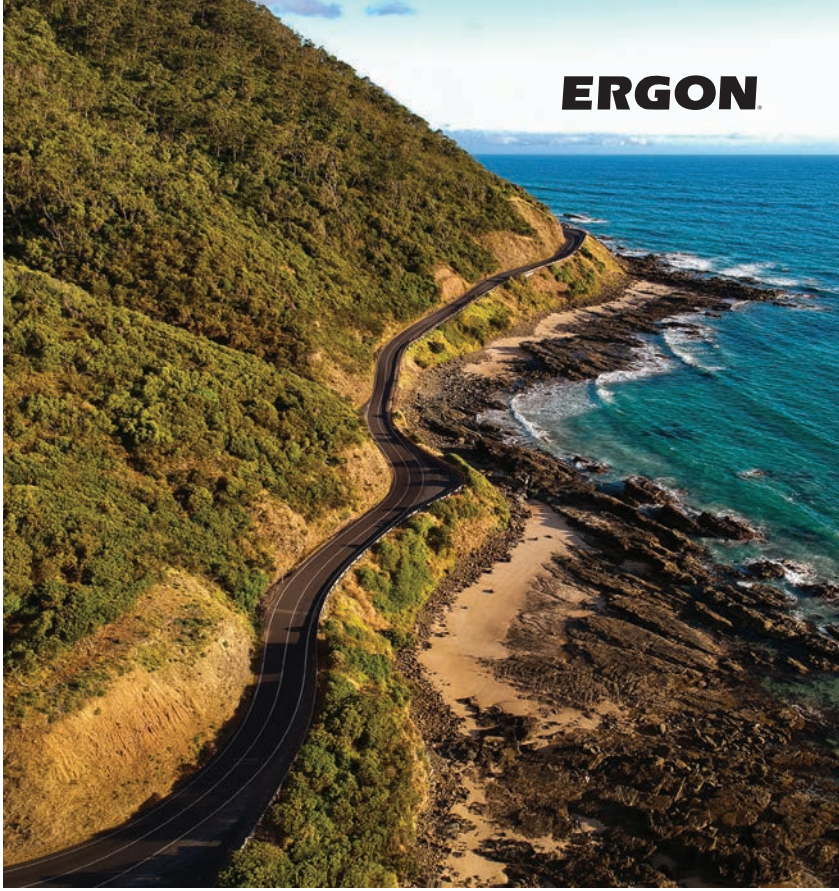

California

CA

California Product Applications

Fontana

Treatment	Products
Bond Coat/Tack Coat – Trackless	BC-1HT (eTac)
Chip Seal – Modified	LMCRS-2H, PMCRS-2H
Cold In-Place Recycling	CIR-EE
Fog Seal – Conventional	CQS-1H, SS-1H
Fog Seal – High Performance	EF-1H (eFog HP)
Fog Seal – Rejuvenating	CMS-1PC (eScrub), PMRE
Fog Seal – Specialty	PMCQS-1H
Full Depth Reclamation	FDR-EE
Hot Applied Trackless Bond Coat	eTac HB
Micro Surfacing – Conventional	MSE, CSS-1HP
Prime Coat – Solventless	CPP-1 (ePrime)
Rejuvenating Scrub Seal	CMS-1PC (eScrub), PMRE
Slurry Seal – Conventional	CQS-1H
Slurry Seal – Modified	PMCQS-1H
Spray Paver Application	PHEM
Tack Coat – Conventional	SS-1H

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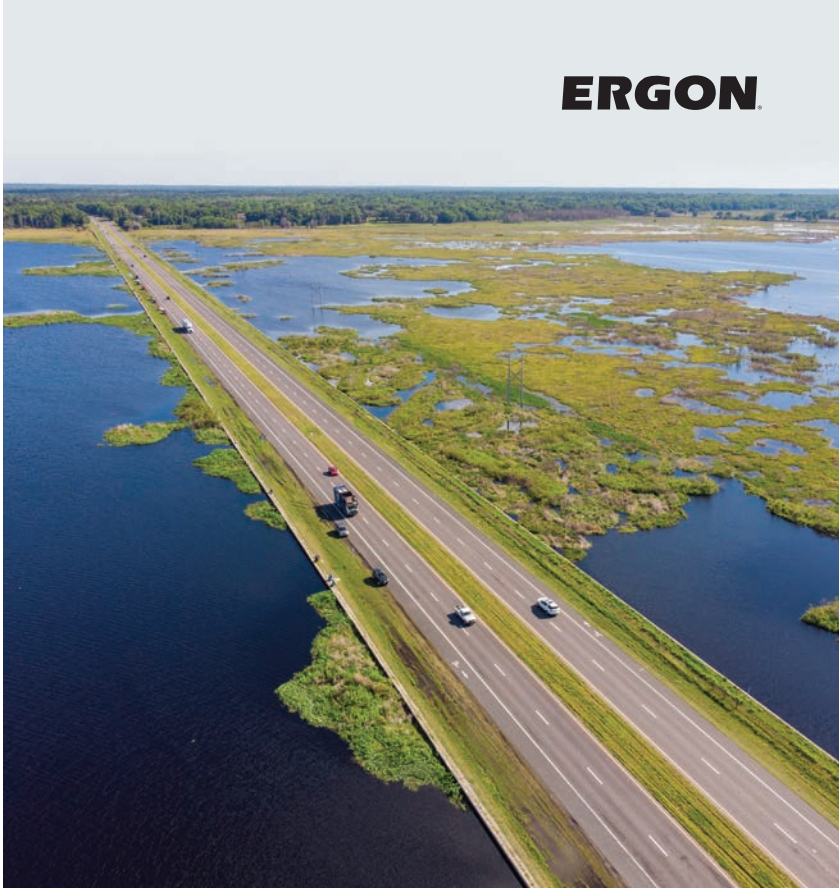

Florida

FL

Florida Product Applications

Tampa

Treatment	Products
Bond Coat/Tack Coat – Trackless	BC-1HT (eTac)
Chip Seal – Conventional	CRS-2
Chip Seal – Modified	CRS-2L
Cold Mix – Premium	RM-90 (ePatch)
Fog Seal – Rejuvenating	CMS-1PF (eFog)
Full Depth Reclamation	CSS-1H
Micro Surfacing – Conventional	CSS-1HP
Prime Coat – Conventional	AE 60/90, SPECIAL MS, EP-RS, RC-70, RC-250, AE 200
Prime Coat – Solventless	CPP-1 (ePrime)
Rejuvenating Scrub Seal	CMS-1PC (eScrub)
Tack Coat – Conventional	CSS-1H, CRS-1, RS-1, RS-1H, SS-1, SS-1H, RS-2

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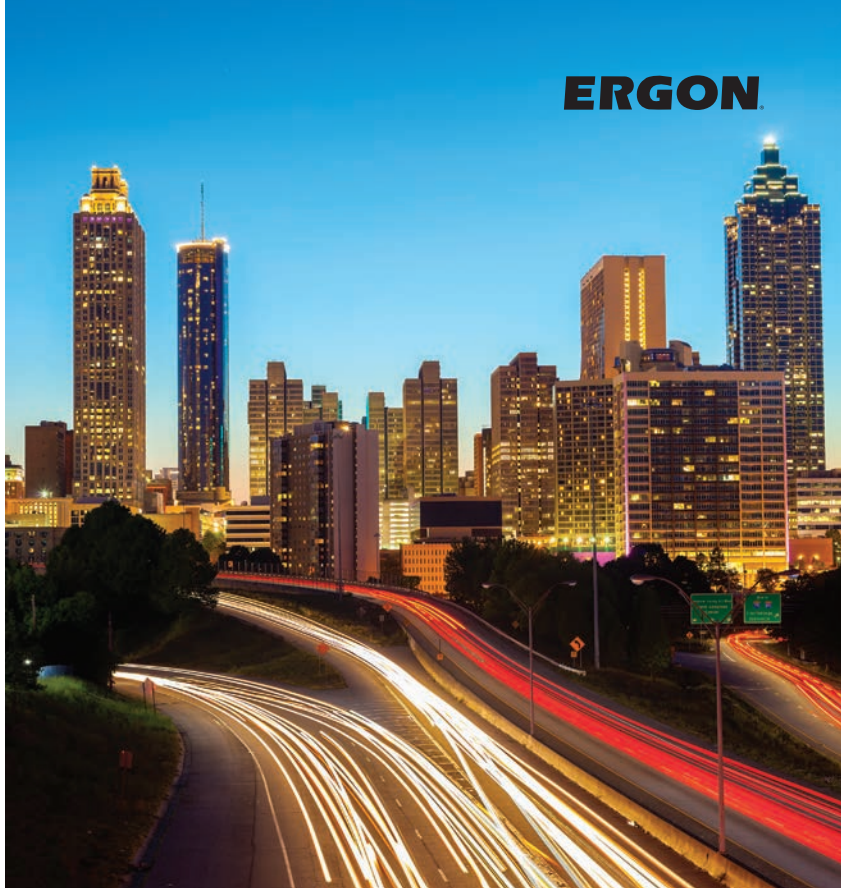

Georgia

GA

Georgia Product Applications

Garden City

Treatment	Products
Bond Coat/Tack Coat – Trackless	BC-1HT
Chip Seal	CRS-2/CRS-2H
Chip Seal – Modified	CRS-2L
Chip Seal/Fog – Modified	CHPF-1
Cold Mix – Recycling	ECR-1
Fog Seal	CSS-1H 50/50
Micro Surfacing	CQS-1H, CQS-1HP/ CSS-1HP
Micro Surfacing	CSS-1EP/CQS-1EP (eFlex)
Prime Coat	MC-70
Rejuvenating Scrub Seal	CMS-1PC (eScrub)
Scrub Seal	CMS-1P
Tack Coat – Conventional	CRS-1, CRS-1H, CRS-2/ CRS-2H, CSS-1, CSS-1H, SS-1H

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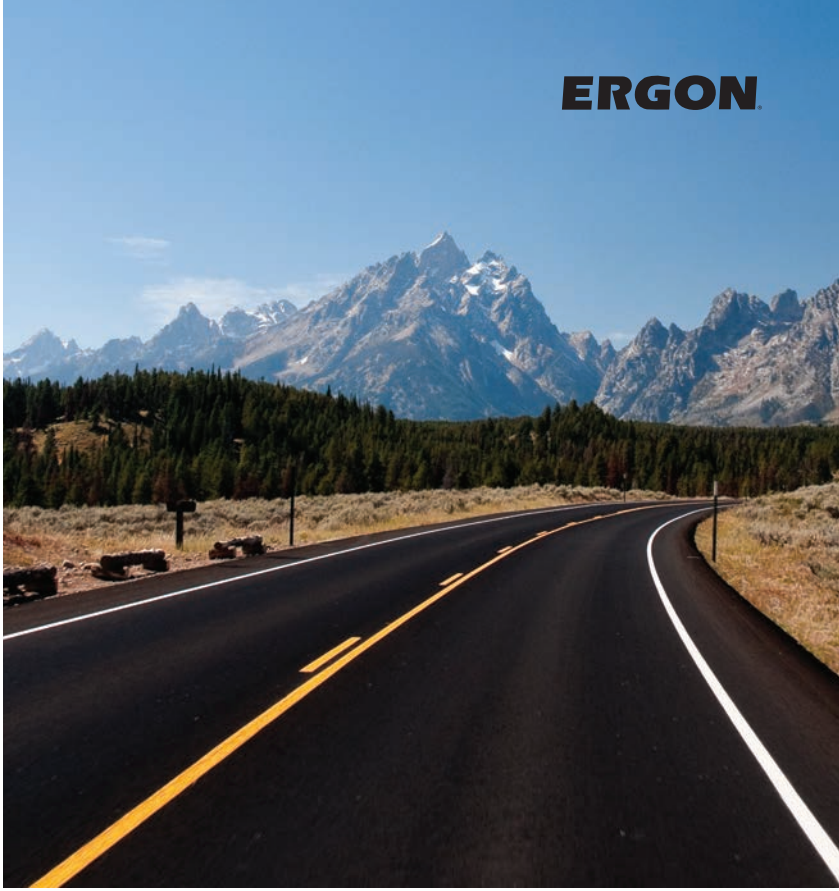

Idaho

ID

Idaho Product Applications

Boise

Treatment	Products
Chip Seal – Conventional	HFE-150, CRS-2, HFE-90
Chip Seal – Modified	LMCRS-2H, CRS-2P, CMS-2P
Chip Seal – Premium	CVRS-2P (eChip)
Cold Mix	ElastiPatch+, CMS-25, CSS-1, CSS-1H
Cold Mix – Conventional	HFE-300
Fog Seal – Conventional	CSS-1H, CSS-1
Fog Seal – Specialty	Quickseal
Micro Surfacing – Conventional	MSE, CQS-1HP
Micro Surfacing – Premium	CSS-1EP (eFlex)
Prime Coat	Quickseal, CSS-1, CSS-1H, CRS-1, PEP-C
Slurry Seal – Conventional	CQS-1H
Slurry Seal – Modified	CQS-1HP
Slurry Seal – Premium	CQS-1EP (eFlex ES)
Tack Coat – Conventional	CSS-1, CSS-1H

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Notes

Kansas

KS

Dodge City

Treatment	Products
Chip Seal – Conventional	CRS-1H, CRS-2
Chip Seal – Modified	CRS-1HM, CRS-2P, CRS-2S, CHFRS-2P
Cold In-Place Recycling	CSS-Special
Cold Mix – Conventional	CMS-1, HFMS-1
Cold In-Place Recycling	CMS-1, HFMS-1
Prime Coat – Conventional	AE-P
Rejuvenating Scrub Seal	CMS-1PC (eScrub)
Spray Paver Application	EBL, PMCRS-1S
Tack Coat – Conventional	SS-1, SS-1H, SS-1HP

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Kansas Product Applications

El Dorado

Treatment	Products
Chip Seal – Conventional	CRS-1H, RS-1H, CRS-2
Chip Seal – Modified	CRS-1HM, CRS-1HP, CRS-2P, RS-1M, RS-1HM, RS-1P, RS-1HP
Cold In-Place Recycling	CMS-1, HFMS-1, MS-1, CSS-Special
Cold Mix – Conventional	CMS-1, HFMS-1, MS-1
Fog Seal – Specialty	CQS-1F
Hot In-Place Recycling	ARA-1P, ARA-2P, ARA, ARA-3P, ECR-1
Prime Coat – Conventional	AE-P
Rejuvenating Scrub Seal	CMS-1PC (eScrub)
Spray Paver Application	PMCRS-1S, EBL, CRS-1S
Tack Coat – Conventional	SS-1, SS-1H, SS-1HP

Kansas Contact Information

Facility Manager: Gregg Lewis
Facility Telephone: 316-321-6760
Facility Address: 800 East 10th Avenue
El Dorado, KS 67042

Sales Manager: Kyle Fox
Sales Telephone: 316-350-0277
Sales Office Address: 800 East 10th Avenue
El Dorado, KS 67042

Websites
ergonasphalt.com
savemyroad.com

NOTE: Most emulsions can be used for multiple applications. Please contact the Area Sales Manager for more information. If the product you want is not listed as available in your area, please contact the Sales Manager.

Salina

Treatment	Products
Chip Seal – Conventional	CRS-1H
Chip Seal – Modified	CRS-1HP, CRS-1HM, CHFRS-2P, CRS-2P
Cold In-Place Recycling	CSS-Special
Cold Mix – Conventional	CMS-1
Rejuvenating Scrub Seal	CMS-1PC (eScrub)
Fog Seal – Rejuvenating	CMS-1PF (eFog)
Slurry Seal – Conventional	CQS-1H
Spray Paver Application	EBL
Tack Coat – Conventional	CSS-1H

Facility Manager: Ryan Peters
Facility Telephone: 785-825-1535
Facility Address: 1100 West Grand Avenue
Salina, KS 67401

Sales Manager: Doug Francis
Sales Telephone: 785-577-2615
Sales Office Address: 630 South Donmyer Road
Solomon, KS 67480

Sales Manager: Kyle Fox
Sales Telephone: 316-350-0277
Sales Office Address: 800 East 10th Avenue
El Dorado, KS 67042

Websites

ergonasphalt.com
savemyroad.com

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Notes

Mississippi

MS

Mississippi Product Applications

Vicksburg

Treatment	Products
Bond Coat/Tack Coat – Trackless	BC-1HT (eTac)
Chip Seal – Conventional	CRS-2
Chip Seal – Modified	CRS-2P
Fog Seal	CSS-1 50/50
Fog Seal – Conventional	CSS-1H
Fog Seal – High Performance	CHPF-1 (eFog HP)
Fog Seal – Rejuvenating	CMS-1PF (eFog)
Hot Applied Trackless Bond Coat	eTac HB
Less-Tracking Fog Seal	EF-1H
Micro Surfacing – Conventional	CSS-1HP, CSS-1EP (eFlex), CQS-1HP
Prime Coat – Solventless	CPP-1 (ePrime)
Rejuvenating Scrub Seal	CMS-1PC (eScrub)
Slurry Seal – Conventional	CQS-1H
Tack Coat – Conventional	CSS-1H

Mississippi Contact Information

Facility Manager: John Harrigill
Facility Telephone: 601-529-9905
Facility Address: 2611 Haining Road
Vicksburg, MS 39183

Sales Manager: Mark Hartman
Sales Telephone: 225-397-8143
Sales Office Address: 730 Carter Street
Centreville, MS 39631

Sales Manager: Amy Walker
Sales Telephone: 601-933-3339
Sales Office Address: P.O. Box 1639
Jackson, MS 39215

Websites
ergonasphalt.com
savemyroad.com

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Notes

Montana

MT

Montana Product Applications

Butte

Treatment	Products
Chip Seal – Conventional	CRS-2
Chip Seal – Modified	CRS-2P
Chip Seal – Premium	CHFRS-2P
Cold In-Place Recycling	CIR-EE
Fog Seal – Conventional	CSS-1H
Full Depth Reclamation	FDR-EE
Hot In-Place Recycling	ARA-1P
Micro Surfacing – Conventional	MSE
Prime Coat – Solventless	CPP-1 (ePrime)
Rejuvenating Scrub Seal	PMRE

Montana Contact Information

Facility Manager: Mark Davis
Facility Telephone: 406-221-2060
Facility Address: 119873 Rick Jones Way
Butte, MT 59701

Sales Manager: Sean Pellersels
Sales Telephone: 406-876-4000
Sales Office Address: 119873 Rick Jones Way
Butte, MT 59701

Websites
ergonasphalt.com
savemyroad.com

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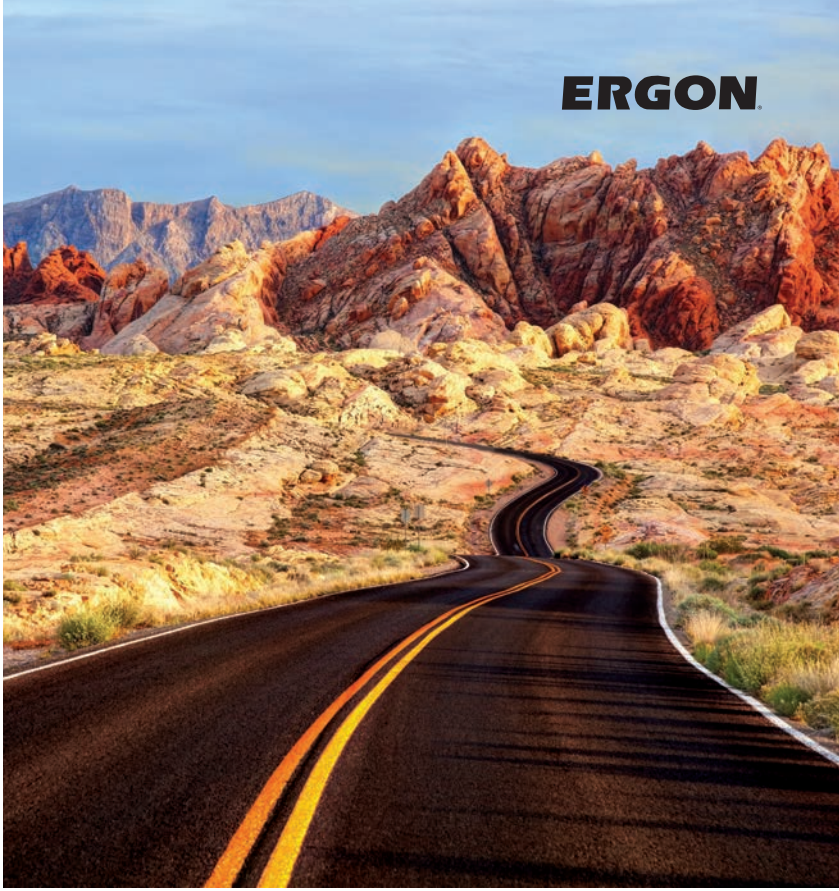
Notes



Nevada

NV

Nevada Product Applications

Las Vegas

Treatment	Products
Chip Seal – Conventional	CRS-2
Chip Seal – Modified	PMRE-H, CRS-2P, LMCRS-2H
Cold In-Place Recycling	CIR
Micro Surfacing – Conventional	CQS-1HP
Prime Coat – Solventless	CPP-1 (ePrime)
Slurry Seal – Conventional	CQS-1H
Slurry Seal – Premium	CQS-1EP (eFlex ES)
Slurry Seal – Modified	LMCQS-1H
Tack Coat – Conventional	CSS-1H, CQS-1NV
Tack Coat – Modified	PMEM

Nevada Contact Information

Facility Manager: Mike Haas
Facility Telephone: 702-736-2059
Facility Address: 3901 West Ponderosa Way
Las Vegas, NV 89118

Sales Manager: Greg Hunt
Sales Telephone: 702-235-7347
Sales Office Address: 3901 West Ponderosa Way
Las Vegas, NV 89118

Websites
ergonasphalt.com
savemyroad.com

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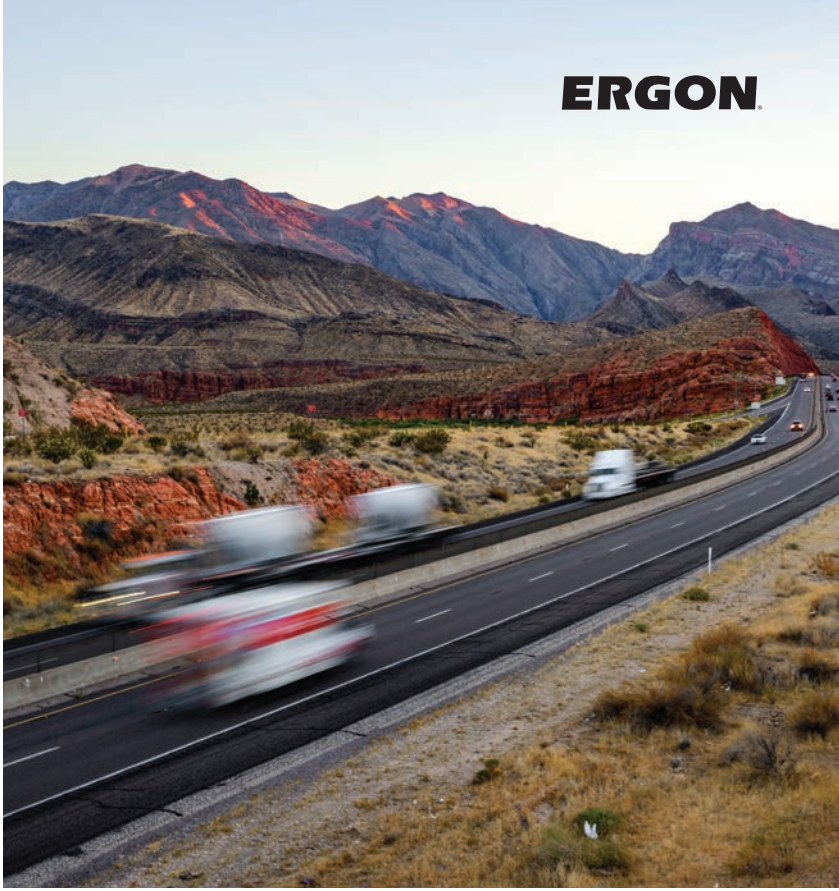
Notes



New Mexico

NM

New Mexico Product Applications

Roswell

Treatment	Products
Chip Seal – Conventional	CRS-2, HFE-90
Chip Seal – Modified	HFE-100P
Cold In-Place Recycling	ProFlex
Fog Seal – Modified	CSS-1P
Hot In-Place Recycling	HFE-300P
Micro Surfacing – Conventional	CQS-1HP
Prime Coat	PEP, AE-P
Tack Coat – Conventional	SS-1H

New Mexico Contact Information

Facility Manager: Juan Miranda
Facility Telephone: 575-347-9727
Facility Address: 49 East Martin Street
Roswell, NM 88203

Sales Manager: Eddie Sedillo
Sales Telephone: 575-808-7633
Sales Office Address: 49 East Martin Street
Roswell, NM 88203

Websites
ergonasphalt.com
savemyroad.com

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Notes

Oklahoma

OK

Oklahoma Product Applications

Ardmore

Treatment	Products
Chip Seal – Conventional	CRS-2
Chip Seal – Modified	CRS-2+
Prime Coat – Conventional	AE-P
Rejuvenating Scrub Seal	CMS-1PC
Tack Coat – Conventional	SS-1

Oklahoma Contact Information

Facility Manager: Kelley Smith
Facility Telephone: 580-223-8010
Facility Address: 2500 Refinery Road
Ardmore, OK 73401

Sales Manager: Johnny Roe
Sales Telephone: 405-595-9073
Sales Office Address: 2500 Refinery Road
Ardmore, OK 73401

Sales Manager: Wendell Nolan
Sales Telephone: 918-408-0845
Sales Office Address: 2500 Refinery Road
Ardmore, OK 73401

Websites
ergonasphalt.com
savemyroad.com

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Oklahoma Product Applications

Catoosa

Treatment	Products
Bond Coat/Tack Coat – Trackless	BC-1HT (eTac)
Chip Seal – Conventional	CRS-2
Chip Seal – Modified	CRS-2S, CRS-2+, CHFRS-2P
Fog Seal – Rejuvenating	CMS-1PF (eFog)
Fog Seal – Specialty	CQS-1F
Prime Coat – Conventional	AE-P
Rejuvenating Scrub Seal	CMS-1PC (eScrub)
Spray Paver Application	CRS-1S
Tack Coat – Conventional	SS-1, SS-1H

Oklahoma Contact Information

Facility Manager: Daniel Clark
Facility Telephone: 918-266-7070
Facility Address: 5850 Arkansas Road
Catoosa, OK 74015

Sales Manager: Wendell Nolan
Sales Telephone: 918-408-0845
Sales Office Address: 2500 Refinery Road
Ardmore, OK 73401

Websites
ergonasphalt.com
savemyroad.com

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Oklahoma Product Applications

Lawton

Treatment	Products
Chip Seal – Conventional	CRS-2
Chip Seal – Modified	CRS-2+, CRS-2S
Chip Seal – Premium	CHFRS-2P
Fog Seal – Specialty	CQS-1F
Prime Coat – Conventional	AE-P
Rejuvenating Scrub Seal	CMS-1PC (eScrub)
Spray Paver Application	CRS-1S
Tack Coat – Conventional	SS-1, SS-1H

Oklahoma Contact Information

Facility Manager: Sean Robbins
Facility Telephone: 580-536-0098
Facility Address: 9301 Southwest Koch Street
Lawton, OK 73505

Sales Manager: Johnny Roe
Sales Telephone: 405-595-9073
Sales Office Address: 2500 Refinery Road
Ardmore, OK 73401

Websites
ergonasphalt.com
savemyroad.com

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Notes

South Carolina

SC

Columbia

Treatment	Products
Bond Coat/Tack Coat – Trackless	QCT-NTRS-1P
Chip Seal – Conventional	CMS-2, CRS-2
Chip Seal – Modified	CRS-2L, CRS-2P
Prime Coat – Conventional	EAP
Tack Coat – Conventional	CRS-1, CRS-1H, CRS-2

South Carolina Contact Information

Facility Manager: Richard Jackson
Facility Telephone: 803-606-6789
Facility Address: 2700 William Tuller Drive
Columbia, SC 29205

Sales Manager: John Mims
Sales Telephone: 803-360-7334

Sales Manager: Brad Dixon
Sales Telephone: 252-717-8981

Sales Manager: Jake Exline
Sales Telephone: 812-230-8154

Websites

ergonasphalt.com
associatedasphalt.com
savemyroad.com

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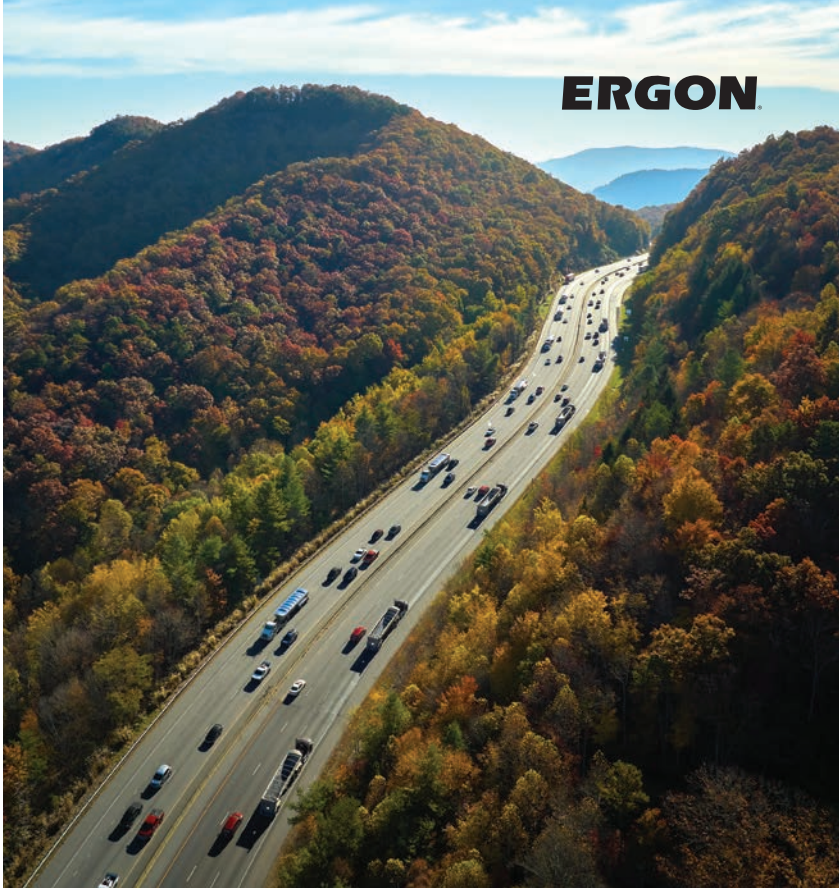
Notes



Tennessee

TN

Tennessee Product Applications

Columbia

Treatment	Products
Bond Coat/Tack Coat – Trackless	BC-1HT (eTac)
Chip Seal – Conventional	CRS-2, RS-2
Chip Seal – Modified	CRS-2P
Cold In-Place Recycling	CIR-EE
Fog Seal – High Performance	CHPF-1 (eFog HP)
Fog Seal – Rejuvenating	CMS-1PF (eFog)
Micro Surfacing – Conventional	CQS-1HP/CSS-1HP
Rejuvenating Scrub Seal	CMS-1PC (eScrub)
Slurry Seal – Conventional	CQS-1H
Tack Coat – Conventional	SS-1H, SS-1

Tennessee Contact Information

Facility Manager: Tom Kajitani
Facility Telephone: 931-325-5400
Facility Address: 1251 North Main Street
Mount Pleasant, TN 38474

Sales Manager: Mark Clark
Sales Telephone: 731-549-5692
Sales Office Address: 5445 Highway 412 East
Parsons, TN 38363

Websites
ergonasphalt.com
savemyroad.com

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Tennessee Product Applications

Memphis

Treatment	Products
Bond Coat/Tack Coat – Trackless	BC-1HT (eTac)
Chip Seal – Conventional	CRS-2
Chip Seal – Modified	CRS-2P AR, CRS-2L/CRS-2P
Fog Seal – High Performance	CHPF-1, EF-1H (eFog HP)
Fog Seal – Rejuvenating	CMS-1PF (eFog)
Full Depth Reclamation	FDR-EE
Hot In-Place Recycling	ARA-3P
Micro Surfacing – Conventional	CSS-1HP, CQS-1HP, CSS-1EP (eFlex)
Prime Coat – Solventless	ePrime
Rejuvenating Scrub Seal	CMS-1PC (eScrub)
Slurry Seal – Modified	CQS-1H

Tennessee Contact Information

Facility Manager: Jeremey Caher
Facility Telephone: 901-947-5800
Facility Address: 1989 Channel Avenue
Memphis, TN 38113

Sales Manager: Mark Clark
Sales Telephone: 731-549-5692
Sales Office Address: 5445 Highway 412 East
Parsons, TN 38363

Sales Manager: Josh Coley
Sales Telephone: 731-225-8943
Sales Office Address: 5445 Highway 412 East
Parsons, TN 38363

Sales Manager: Bear Horne
Sales Telephone: 901-619-9229
Sales Office Address: P.O. Box 1639
Jackson, MS 39215-1639

Sales Manager: Gene Arnold
Sales Telephone: 901-277-1700
Sales Office Address: 1989 Channel Avenue
Memphis, TN 38113

Sales Manager: Darryl Gardner
Sales Telephone: 501-590-3145
Sales Office Address: 7513 Toltec Drive
North Little Rock, AR 72116

Websites

ergonasphalt.com
savemyroad.com

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Tennessee Product Applications

Nashville

Treatment	Products
Bond Coat/Tack Coat – Trackless	BC-1HT (eTac)

Tennessee Contact Information

Facility Manager: Jason Moore
Facility Telephone: 615-242-8110
Facility Address: 1114 Visco Drive
Nashville, TN 37210

Sales Manager: Mark Bailey
Sales Telephone: 615-476-9084
Sales Office Address: 1114 Visco Drive
Nashville, TN 37210

Sales Manager: Clark Harrington
Sales Telephone: 731-676-5663
Sales Office Address: 1114 Visco Drive
Nashville, TN 37210

Websites
ergonasphalt.com
savemyroad.com

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Parsons

Treatment	Products
Chip Seal – Conventional	RS-2, CRS-2
Cold Mix – Conventional	AE3-Modified
Cold Mix – Premium	RM-90 (ePatch)
Prime Coat – Conventional	AE-P
Tack Coat – Conventional	SS-1

Facility Manager: Russell Carrington
Facility Telephone: 731-847-6351
Facility Address: 5445 Highway 412 East
Parsons, TN 38363

Sales Manager: Mark Clark
Sales Telephone: 731-549-5692
Sales Office Address: 5445 Highway 412 East
Parsons, TN 38363

Websites
ergonasphalt.com
savemyroad.com

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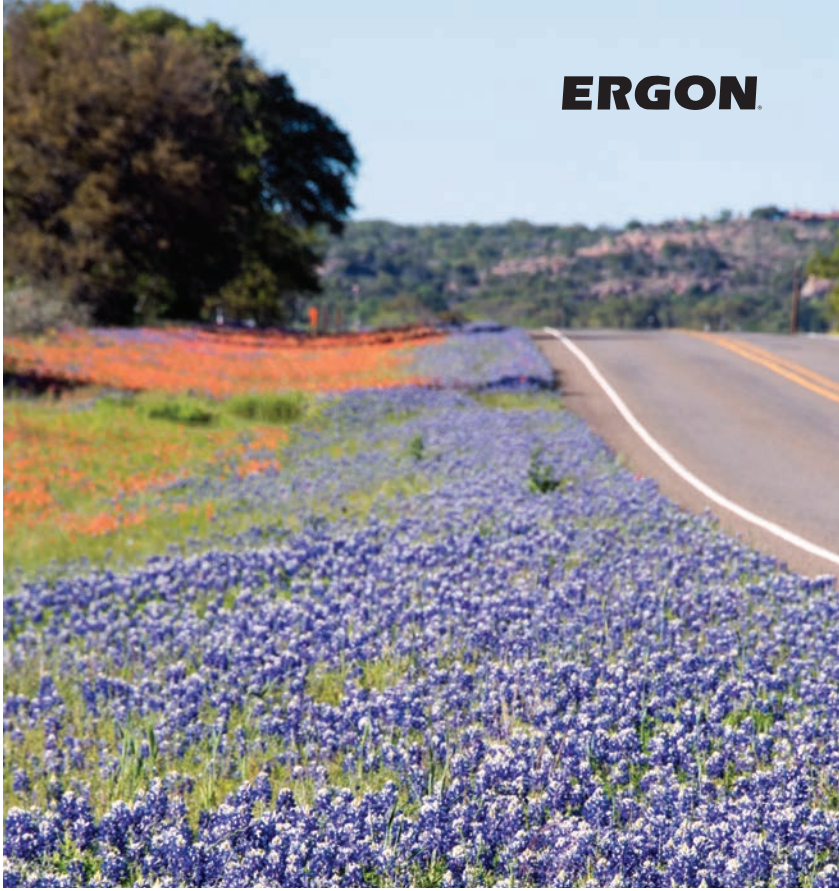
Notes



Texas

TX

Texas Product Applications

Austin

Treatment	Products
Bond Coat/Tack Coat – Trackless	NT-HRE (eTac)
Chip Seal – Conventional	HFRS-2
Chip Seal – Modified	HFRS-2P
Cold Mix – Conventional	AES-300
Fog Seal	MS-2
Fog Seal – Conventional	SS-1
Fog Seal – High Performance	NT-HRE 66/33 (eFog HP)
Prime Coat – Conventional	AE-P

Texas Contact Information

Facility Manager: Brandon White
Facility Telephone: 512-345-0975
Facility Address: 8803 North Mopac Expressway
Austin, TX 78759

Sales Manager: Cody Chambliss
Sales Telephone: 512-618-5313
Sales Office Address: 11612 RM 2244
Building 1, Suite 250
Austin, TX 78738

Websites
ergonasphalt.com
savemyroad.com

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Texas Product Applications

Corpus Christi

Treatment	Products
Chip Seal – Conventional	CRS-2, HFRS-2
Chip Seal – Modified	CRS-2P, HFRS-2P
Prime Coat – Conventional	AE-P
Spray Paver Application	EBL
Tack Coat – Conventional	SS-1, SS-1H

Texas Contact Information

Facility Manager: Michael Magana
Facility Telephone: 361-289-6147
Facility Address: 6746 Up River Road
Corpus Christi, TX 78409

Sales Manager: Ernesto Santillan
Sales Telephone: 361-271-6465
Sales Office Address: 11612 RM 2244
Building 1, Suite 250
Austin, TX 78738

Websites
ergonasphalt.com
savemyroad.com

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Texas Product Applications

Lubbock

Treatment	Products
Chip Seal – Conventional	CRS-2
Chip Seal – Modified	CRS-2P, CHFRS-2P
Cold Mix	CMS-2S
Fog Seal – Rejuvenating	CMS-1P (eFog)
Full Depth Reclamation	FDR EM-HY/ProFlex
Prime Coat – Conventional	AE-P
Rejuvenating Scrub Seal	CMS-2P (eScrub)
Tack Coat – Conventional	CSS-1H

Texas Contact Information

Facility Manager: Jake Neitsch
Facility Telephone: 806-589-4850
Facility Address: 1611 Marshall Street
Lubbock, TX 79403

Sales Manager: Tracy Cumby
Sales Telephone: 806-549-5133
Sales Office Address: 2464 County Road 351
Justiceburg, TX 79330

Sales Manager: Jim Hull
Sales Telephone: 214-972-8824

Websites
ergonasphalt.com
savemyroad.com

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Texas Product Applications

Mount Pleasant

Treatment	Products
Bond Coat/Tack Coat – Trackless	NT-SRE (eTac)
Chip Seal – Conventional	CRS-2
Chip Seal – Modified	CHFRS-2P, CRS-2P
Cold Mix	CMS-2S
Dust Control Emulsion	CSS-1S
Fog Seal – Conventional	CSS-1
Spray Paver Emulsion	EBL
Tack Coat – Conventional	CSS-1, CSS-1H

Texas Contact Information

Facility Manager: John Hallford
Facility Telephone: 903-572-9839
Facility Address: 209 Robert Nance Road
Mount Pleasant, TX 75455

Sales Manager: Cody Fuller
Sales Telephone: 903-296-1728
Sales Office Address: 209 Robert Nance Road
Mount Pleasant, TX 75455

Sales Manager: Travis King
Sales Telephone: 903-520-8728
Sales Office Address: 209 Robert Nance Road
Mount Pleasant, TX 75455

Websites
ergonasphalt.com
savemyroad.com

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Texas Product Applications

Pleasanton

Treatment	Products
Bond Coat/Tack Coat – Trackless	NT-SRE (eTac)
Chip Seal – Conventional	CRS-2
Chip Seal – Modified	CRS-2P
Chip Seal – Premium	CHFRS-2P
Fog Seal	CSS-1H
Fog Seal – Rejuvenating	CMS-1P (eFog)
Full Depth Reclamation	CSS-1H, EE-1
Prime Coat – Conventional	AE-P
Rejuvenating Scrub Seal	CMS-2P (eScrub)
Tack Coat – Conventional/ Modified	CSS-1H, EE-1

Texas Contact Information

Facility Manager: Trey Smith
Facility Telephone: 830-569-8731
Facility Address: 907 Second Street
Pleasanton, TX 78064

Sales Manager: Cody Chambliss
Sales Telephone: 512-618-5313
Sales Office Address: 11612 RM 2244
Building 1, Suite 250
Austin, TX 78738

Sales Manager: Ernesto Santillan
Sales Telephone: 361-271-6465
Sales Office Address: 11612 RM 2244
Building 1, Suite 250
Austin, TX 78738

Websites
ergonasphalt.com
savemyroad.com

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Texas Product Applications

Saginaw

Treatment	Products
Bond Coat/Tack Coat – Trackless – TRAIL	NT-HRE (eTac)
Chip Seal – Conventional	CRS-2
Chip Seal – Modified	CRS-2P
Cold Mix	CMS-2S
Fog Seal – Conventional	CSS-1H
Full Depth Reclamation	CSS-1H, FDR EM-HY/ ProFlex
Full Depth Reclamation	FDR EM-HY/ProFlex
Micro Surfacing – Conventional	CSS-1P
Micro Surfacing – Highly Modified	CSS-1EP (eFlex Micro)
Modified Recycling Emulsion	ARA-1P
Prime Coat – Conventional	AE-P
Slurry Seal – Highly Modified	CQS-1EP (eFlex Slurry)
Spray Paver Emulsion – TRAIL	EBL
Tack Coat – Conventional	CSS-1H

Texas Contact Information

Facility Manager: Nathan Swearingen
Facility Telephone: 817-232-3658
Facility Address: 600 Minton Road
Saginaw, TX 76179

Sales Manager: Patrick Coyle
Sales Telephone: 817-379-9451
Sales Office Address: 10381 Alta Vista Road
Suite 137
Fort Worth, TX 76244

Sales Manager: Jim Hull
Sales Telephone: 214-972-8824

Websites
ergonasphalt.com
savemyroad.com

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Texas Product Applications

Temple

Treatment	Products
Bond Coat/Tack Coat – Trackless	NT-SRE (eTac)
Chip Seal – Conventional	CRS-2
Chip Seal – Modified	CRS-2P
Chip Seal – Premium	CHFRS-2P
Fog Seal – Conventional	CSS-1H
Full Depth Reclamation	CSS-1H
Micro Surfacing – Conventional	CSS-1P
Prime Coat – Conventional	AE-P
Slurry Seal – Modified	CQS-1HLM
Spray Paver Application	EBL
Tack Coat – Conventional	CSS-1H

Texas Contact Information

Facility Manager: Danny Leal
Facility Telephone: 254-773-8040
Facility Address: 4648 Western Way
Temple, TX 76504

Sales Manager: David Stroud
Sales Telephone: 254-715-3921
Sales Office Address: 4648 Western Way
Temple, TX 76504

Websites
ergonasphalt.com
savemyroad.com

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Notes

Virginia

VA

Virginia Product Applications

Dumfries

Treatment	Products
Chip Seal – Conventional	CRS-2
Chip Seal – Modified	CRS-2L
Tack Coat – Conventional	CRS-1

Virginia Contact Information

Facility Manager: Vinnie Murabito
Facility Telephone: 703-221-1171
Facility Address: 18000 Cockpit Point Road
Dumfries, VA 22026

Sales Manager: Paul Staley
Sales Telephone: 540-494-3506
Sales Office Address: 900 Trents Ferry Road
Lynchburg, VA 24503

Websites
ergonasphalt.com
savemyroad.com

NOTE: Most emulsions can be used for multiple applications. If the product you want is not listed as available in your area, please contact the Sales Manager.

Virginia Product Applications

Bristol

Treatment	Products
Bond Coat/Tack Coat – Trackless	NTCRS-1HSP
Chip Seal – Conventional	CRS-2
Chip Seal – Modified	CRS-2L
Tack Coat	CSS-1H

Virginia Contact Information

Facility Manager: Jeremy Sexton
Facility Telephone: 276-644-7734
Facility Address: 140 Spurgeon Lane
Bristol, VA 24201

Sales Manager: Danny Moran
Sales Telephone: 540-529-7247
Sales Office Address: 110 Franklin Road SE
Roanoke, VA 24011

Sales Manager: Jake Exline
Sales Telephone: 812-230-8154

Websites
ergonasphalt.com
associatedasphalt.com
savemyroad.com

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Virginia Product Applications

Roanoke

Treatment	Products
Bond Coat/Tack Coat – Trackless	NTCRS-1HSP
Chip Seal – Conventional	CRS-2
Chip Seal/Prime Coat – Conventional	CRS-2L
Tack Coat	CRS-1H

Virginia Contact Information

Facility Manager: Kyle Redenbaugh
Facility Telephone: 512-987-3702
Facility Address: 2677 Roanoke Avenue
Roanoke, VA 24027

Sales Manager: Danny Moran
Sales Telephone: 540-529-7247
Sales Office Address: 110 Franklin Road SE
Roanoke, VA 24011

Websites
ergonasphalt.com
associatedasphalt.com
savemyroad.com

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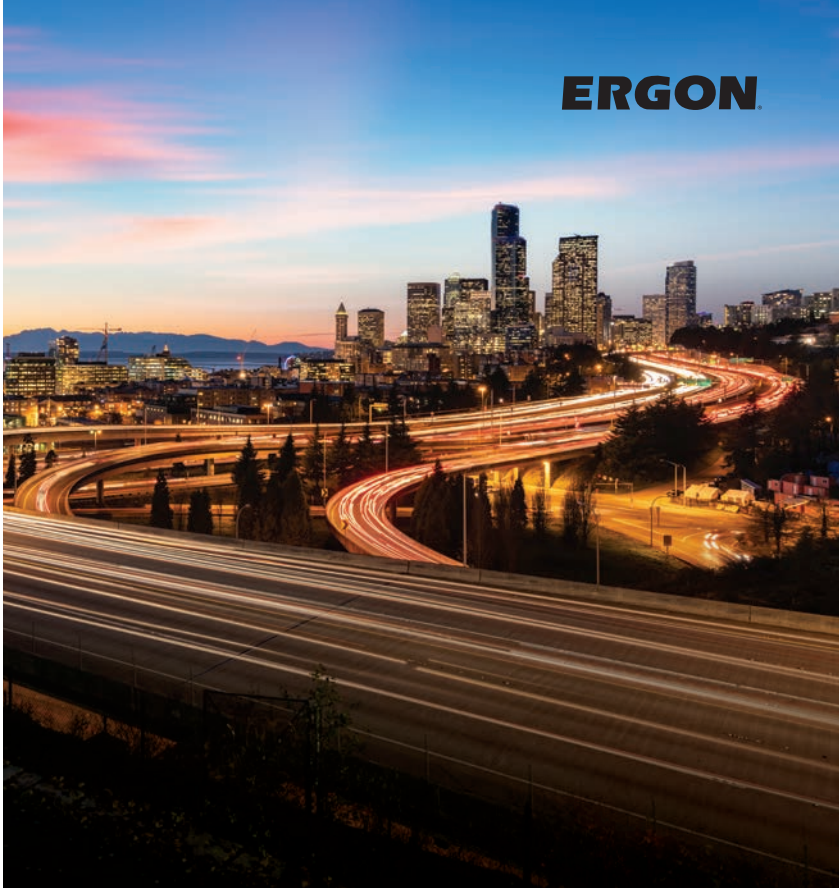
Notes



Washington

WA

Washington Product Applications

Pasco

Treatment	Products
Chip Seal – Conventional	HFE-150, HFE-90, CRS-2
Chip Seal – Modified	CRS-2P, CRS-3P
Cold Mix – Conventional	CMS-2S
Fog Seal – Specialty	Quickseal
Prime Coat – Conventional	PEP-C
Tack Coat – Conventional	CSS-1

Washington Contact Information

Facility Manager: Jeff Kurth
Facility Telephone: 509-545-9864
Facility Address: 3152 Selph Landing Road
Pasco, WA 99301

Sales Manager: Stan Brogdon
Sales Telephone: 509-531-1553

Websites
ergonasphalt.com
savemyroad.com

NOTE: Most emulsions can be used for multiple applications. If the product you want is not listed as available in your area, please contact the Sales Manager.

Washington Product Applications

Hillyard (Spokane)

Treatment	Products
Cold Mix	ElastiPatch+
Tack Coat – Conventional	CSS-1

Washington Contact Information

Facility Manager: Steve Barto
Facility Telephone: 509-487-4560
Facility Address: 4327 North Thor Street
Spokane, WA 99217

Sales Manager: Evan Henninger
Sales Telephone: 509-487-4560

Sales Manager: Zack Macdonald
Sales Telephone: 509-934-6044

Websites
ergonasphalt.com
savemyroad.com

NOTE: Most emulsions can be used for multiple applications. If the product you want is not listed as available in your area, please contact the Sales Manager.

Washington Product Applications

Valley (Spokane)

Treatment	Products
Chip Seal – Conventional	HFE-150, HFE-90, CRS-2
Chip Seal – Modified	CRS-2P, CMS-2P
Chip Seal – Premium	CHFRS-2P, CVRS-2P (eChip)
Cold In-Place Recycling	CIR-EE
Fog Seal – Specialty	Quickseal
Full Depth Reclamation	FDR-EE
Micro Surfacing – Conventional	MSE
Prime Coat – Conventional	PEP-C
Rejuvenating Scrub Seal	PMRE
Slurry Seal – Conventional	CQS-1H
Slurry Seal – Modified	CQS-1HP
Tack Coat – Conventional	CSS-1, CSS-1H

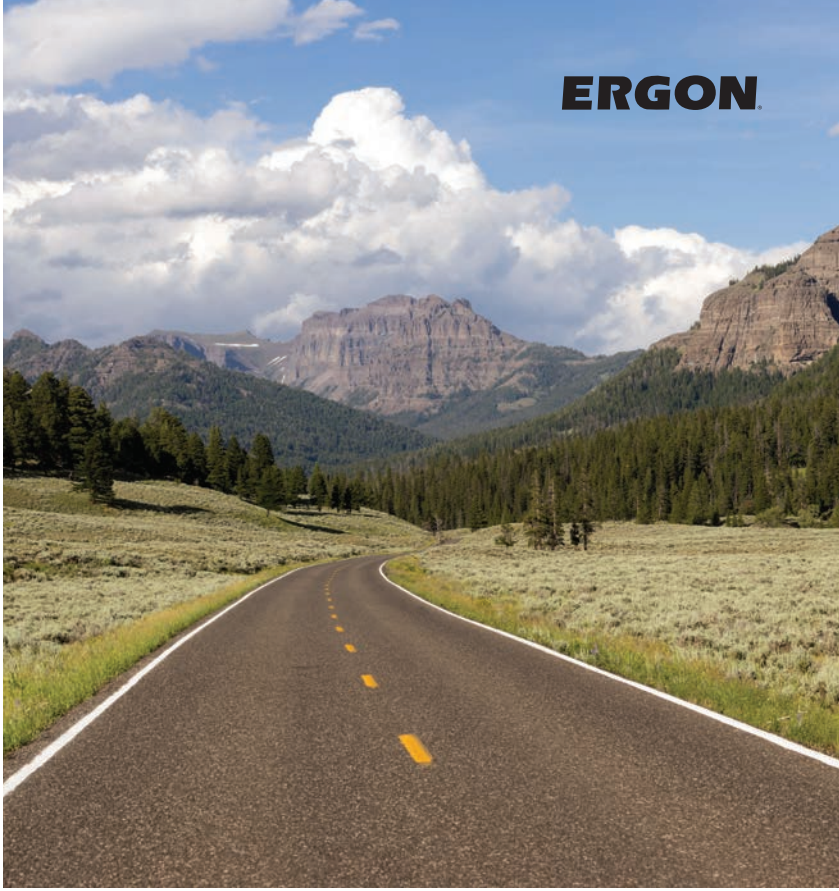
Washington Contact Information

Facility Manager: Steve Barto
Facility Telephone: 509-487-4560
Facility Address: 16710 East Euclid Avenue
Spokane, WA 99216

Websites
ergonasphalt.com
savemyroad.com

NOTE: Most emulsions can be used for multiple applications. If the product you want is not listed as available in your area, please contact the Sales Manager.

Notes



Wyoming

WY

Wyoming Product Applications

Cheyenne

Treatment	Products
Chip Seal – Conventional	CRS-2
Chip Seal – Modified	CRS-2P, CRS-2VHL
Chip Seal – Premium	CHFRS-2P
Hot In-Place Recycling	ARA-1P, ARA-2P
Micro Surfacing – Premium	CSS-1EP (eFlex)
Prime Coat – Solventless	ePrime
Rejuvenating Scrub Seal	PMRE
Slurry Seal – Conventional	CQS-1H
Slurry Seal – Modified	CQS-1HP
Slurry Seal – Premium	CQS-1EP (eFlex ES)
Tack Coat – Conventional	CSS-1H, CSS-1

Wyoming Contact Information

Facility Manager: Chris Camargo
Facility Telephone: 307-638-2633
Facility Address: 4511 South Industrial Road
Cheyenne, WY 82007

Sales Manager: Hank Cuevas
Sales Telephone: 307-823-2879
Sales Office Address: 4511 South Industrial Road
Cheyenne, WY 82007

Websites
ergonasphalt.com
savemyroad.com

NOTE: Most emulsions can be used for multiple applications. If the product you want is not listed as available in your area, please contact the Sales Manager.

Handling Asphalt Emulsions

Do's & Don'ts of Storage & Handling of Asphalt Emulsions

DO

- Set the clearance on pumps for emulsions to prevent binding and breakage of the emulsion.
- Clear lines, valves and pumps of emulsion.
- Drain pumps and remove plugs during freezing weather. No. 1 or No. 2 fuel oil may be used to keep pumps free.
- Warm the pump casings and packing glands to 150°F (65°C) to ease start-up.
- Store emulsions in vertical tanks to prevent excessive skin formation.
- Store emulsions at the temperature specified for the particular grade and application.
- Store emulsion in insulated tanks to protect from freezing and make most efficient use of heat.
- Use large, side-mounted, slow-moving propellers, mounted 3 feet from the bottom of the tank, to "roll" the emulsion to prevent skin from forming. Overmixing should be avoided.
- Gently circulate emulsions when heating or after prolonged storage.
- Place inlet and return lines near the bottom of the tank to prevent foaming.
- Pump from the bottom of the tank to minimize contamination from skinning that may have formed.
- Check compatibility of water and emulsion in a flask prior to larger volume use.
- Dilute medium- and slow-setting emulsions by adding warm water to the emulsion.
- Provide adequate ventilation.
- Drain tanks to no measurable quantity before adding an emulsion of a different type. Emulsions with the same designation may be very different in performance.
- Heat only to reasonable temperatures.
- Haul emulsion in truck transports with baffle plates to prevent sloshing.
- Follow manufacturers recommendation for cleanout or cleanup at the end of the day.
- Follow supplier's storage and handling recommendations or guidance for each product.
- Contact your local representative with any questions.

DON'T

- Use tight clearance pumps; they may seize.
- Leave emulsion in pumps, valves or lines during freezing weather.
- Hold emulsions in lines and pumps for extended periods.
- Apply severe heat to pump casings or packing glands. The pump may be damaged, and the emulsion may break.
- Allow heating surfaces to exceed 185°F (85°C). This will cause emulsion to break on the heating surface.
- Store emulsions in horizontal tanks.
- Circulate emulsions excessively. Emulsions tend to lose viscosity when pumped. Air may also become entrained and lead to an unstable emulsion. Excessive pumping may also lead to the emulsion breaking.
- Use forced air to agitate emulsions.
- Dilute rapid-setting emulsions with water. Never add emulsion to water.
- Dilute emulsions with non-potable water or cold water.

- Dilute emulsions with fuel oil, diesel fuel or kerosene.
- Put fuel oil, diesel fuel or kerosene on top of a tank of emulsion to prevent skin from forming.
- Pump emulsions into open air or have inlet lines near the top of the tank.
- Place outlet lines in mid tank.
- Subject emulsion or the open air above it to open flame or strong oxidants. Never heat the emulsion over 190°F (88°C).
- Mix emulsions of different chemical types, classes, grades or designations in storage tanks, trailers, transports or distributors. Anionic and cationic emulsions may coagulate when mixed.
- Load emulsion into storage tanks, tank cars, tank transporters or distributors containing remains of an incompatible material.
- Proceed if you have questions.

Asphalt Emulsions Storage

Why are asphalt emulsion storage and handling requirements important?
Asphalt emulsions are a dispersion of fine droplets of asphalt cement in water. Since water is the carrier, medium-specific storage and handling procedures should be followed.

What is the proper storage temperature for storing asphalt emulsions?
Store asphalt emulsion between 50°F (10°C) and 185°F (85°C). Do not permit the asphalt emulsion to be heated above 185°F (85°C). At elevated temperatures, the water will evaporate, changing the characteristics of the asphalt emulsion. The following chart outlines minimum and maximum temperatures for various grades of asphalt emulsion.

Grade	Minimum Temperature °F (°C)	Maximum Temperature °F (°C)
RS-1	70° (20°)	140° (60°)
RS-2, CRS-1, CRS-2, HFRS-2	125° (50°)	185° (85°)
SS-1, SS-1H, CSS-1, CSS-1H, MS-1, HFMS-1	50° (10°)	140° (60°)
CMS-2, CMS-2H, MS-2, MS-2H, HFMS-2H, HFMS-2S	125° (50°)	185° (85°)

What will happen if the asphalt emulsion freezes?
This will break the asphalt emulsion, separating the asphalt from the water. The result will be two layers in the tank, neither of which will be suited for the intended use. Likewise, the tank will be difficult to empty.

What type of storage tank is best suited for storing asphalt emulsions?
Vertical storage tanks are best suited to store emulsions. Vertical tanks expose the least amount of surface area to air, thus reducing oxidation. Tanks must also be insulated with a weather-resistant covering to protect the asphalt emulsion from freezing and provide the most efficient use of heat. Additionally, side-entering propeller mixers can be used to gently agitate the asphalt emulsion. This eliminates any skin formation. Side-entry mixer placement must be engineered to the size of the storage tank.

Can a pump be used to mix and circulate a storage tank of asphalt emulsions?
Yes. However, overpumping is to be avoided since some asphalt emulsions are shear sensitive. Overpumping and overmixing can significantly alter the characteristics of the asphalt emulsion. Tanks should be circulated from top to bottom.

Can asphalt emulsions of different classes be mixed together?
Any amount of material remaining within a tank or tanker must be compatible with the added emulsion, and the amount remaining must be insufficient to cause the emulsion to fall out of specification. When asphalt emulsions of different classes are commingled in measurable quantities, the asphalt emulsion will become unstable and break. If in doubt, check with your asphalt emulsion supplier.

Last Product in Tank

Product to be Loaded	Asphalt Cement (Includes Industrial Asphalt)	Cutback Asphalt and Residual Oils	Cationic Emulsion	Anionic Emulsion	Any Product Not Listed
Cationic Emulsion	Empty to no measurable quantity	Tank must be cleaned	Contact supplier or empty to no measurable quantity	Tank should be cleaned	Tank must be cleaned
Anionic Emulsion			Tank should be cleaned	Contact supplier or empty to no measurable quantity	
Asphalt Cement			Tank must be empty; dangerous condition may result	Tank must be empty; dangerous condition may result	

Asphalt Emulsions & Health

Are there any health or safety precautions that should be exercised when using asphalt emulsions?
Avoid breathing fumes, vapors and/or mist. Obtain a copy of the supplier's Material Safety Data Sheet (MSDS). Read the MSDS carefully and follow it. For a copy of an MSDS, please visit the Ergon website at *ergonasphalt.com* and follow the links to the MSDS page.

Sampling

Goal: Obtain samples that are truly representative of material, that are not contaminated and that will resist deterioration during shipping and/or storage. Above all, sampling should be done in a manner safe for the employee. More information can be found in AASHTO T40 or ASTM D140, Standard Practice for Sampling Bituminous Materials.

- Before sampling, the MSDS from the supplier should be carefully read and followed.
- Care should be taken to avoid breathing fumes, mists and/or vapors.
- To protect skin, gloves should be worn and long sleeves fastened over the gloves at the wrist.
- Face shields should be worn to protect against splashed material and any fumes.
- There shall be no smoking while sampling asphalt or emulsions.
- Sample containers must be new, clean and dry, and not be rinsed, washed or cleaned. Plastic gallon jugs are preferred for emulsions. Any containers that are not clean and dry should be discarded.

- The lid should fit tightly and properly on the sample container.
- Care should be taken to prevent any possible contamination.
- The sample container should not be submerged in solvent nor wiped with a cloth or rag containing solvent. If there is any material on the outside of the container, it should be wiped with a clean, dry cloth immediately after the container is sealed and removed from the sampling device.
- During sealing and wiping, the container should be on a firm, level surface to prevent splashing, dropping or spilling.
- The sample must not be transferred to another container.
- The filled container should be tightly and positively sealed immediately after the sample is taken.
- The sample should be properly marked for identification with a permanent marker on the container itself, not the lid.
- The sample should be identified with the following at a minimum:
    - Shipper's name and bill of lading or loading
    - Slip number
    - Date sampled
    - Sampler's name
    - Sample location (place sample taken)
    - Product grade
    - Project identification
    - Other information as necessary
- When sampling, "waste" some material to clean the line out of any old emulsion. When sampling from a distributor truck, the sample port should be used, not the spray bar. Emulsion samples should be packaged, labeled and protected from freezing during shipment. They should also be shipped to the laboratory the same day they are taken. To protect from shipping damage, the containers should be tightly sealed and carefully packed in protective material.

Conversion Charts

pressure	atm	inches of water	cm of Hg	N/m^2	lb/in^2 (psi)
1 atmosphere	1	4.068×10^2	7.6×10^1	1.013×10^5	1.470×10^1
1 inch of water	2.458×10^{-3}	1	0.1868	2.491×10^2	3.613×10^{-2}
1 cm of water	1.316×10^{-2}	5.353	1	1.333×10^3	0.1934
1 newton/m^2	9.869×10^{-6}	4.105×10^{-3}	7.501×10^{-4}	1	1.450×10^{-4}
1 lb/in^2	6.805×10^{-2}	2.768×10^1	5.171	6.895×10^3	1

density	$slug/ft^3$	lbm/ft^3	lbm/in^3	kg/m^3	g/cm^3
1 slug per ft^3	1	3.217×10^1	1.862×10^{-2}	5.154×10^2	0.5154
1 pound – mass per ft^3	3.108×10^{-2}	1	5.787×10^{-4}	1.602×10^1	1.602×10^{-2}
1 pound – mass per $inch^3$	5.371×10^1	1.728×10^3	1	2.768×10^4	2.768×10^1
1 kilogram per $meter^3$	1.940×10^{-3}	6.243×10^{-2}	3.613×10^{-5}	1	1×10^{-3}
1 gram per $centimeter^3$	1.940	6.243×10^1	3.613×10^{-3}	1×10^3	1

Conversion Charts

speed	ft/sec	km/hr	m/sec	mi/hr	knot
1 foot per second	1	1.097	0.348	0.6818	0.5925
1 kilometer per hour	0.9113	1	0.2778	0.6214	0.5400
1 meter per second	3.281	3.6	1	2.237	1.944
1 mile per hour	1.467	1.609	0.4470	1	0.8689
1 knot	1.688	1.852	0.5144	1.151	1

length	meter	kilometer	inch	feet	miles
1 meter	1	1×10^{-3}	39.37	3.281	6.214×10^{-4}
1 kilometer	1000	1	3.937×10^{4}	3281	0.6214
1 inch	0.0254	2.54×10^{-5}	1	0.0833	1.578×10^{-5}
1 foot	0.3048	3.048×10^{-4}	12	1	1.894×10^{-4}
1 mile	1609	1.609	6.336×10^{4}	5280	1

Conversion Charts

area	m^2	cm^2	ft^2	$inch^2$
1 square meter	1	1.0×10^{4}	10.76	1550
1 square centimeter	1.0×10^{-4}	1	1.076×10^{-3}	0.1550
1 square foot	9.290×10^{-2}	929	1	144
1 square inch	6.452×10^{-4}	6.452	6.944×10^{-3}	1

volume	m^3	cm^3	ft^3	$inch^3$
1 cubic meter	1	1.0×10^{6}	35.31	6.102×10^{4}
1 cubic centimeter	1×10^{-6}	1	3.531×10^{-5}	0.06102
1 cubic foot	2.832×10^{-2}	28.320	1	1728
1 cubic inch	1.639×10^{-5}	16.39	5.787×10^{-4}	1

Conversion Charts

mass	gram	kilogram	pound-mass (lbm)	slug	ton-mass
1 gram	1	1.0×10^{-3}	2.205×10^{-3}	6.852×10^{-5}	1.102×10^{-6}
1 kilogram	1×10^{3}	1	2.205	6.852×10^{-2}	1.102×10^{-3}
1 pound-mass	4.536×10^{2}	0.4536	1	3.108×10^{-2}	5.0×10^{-4}
1 slug	1.459×10^{4}	1.459×10^{1}	3.217×10^{1}	1	1.609×10^{-2}
1 ton-mass	9.072×10^{5}	9.07×10^{2}	2.0×10^{3}	6.216×10^{1}	1

force	dyne	kgf	N	lb	pdf
1 dyne	1	1.020×10^{-6}	1.0×10^{-5}	2.248×10^{-5}	-
1 kilogram force	9.807×10^{5}	1	9.807	2.205	7093
1 newton	1.0×10^{5}	0.1020	1	0.2248	7.233
1 pound	4.448×10^{5}	0.4536	4.448	1	32.17
1 poundal	1.383×10^{4}	1.410×10^{-2}	0.1383	3.108×10^{-2}	1

Conversion Charts

	Fahrenheit	Celsius
	20.00	-6.67
	25.00	-3.89
	30.00	-1.11
Freezing Temp.	**32.00**	**0.00**
	35.00	1.67
	40.00	4.44
	45.00	7.22
	50.00	10.00
	55.00	12.78
	60.00	15.56
	65.00	18.33
	70.00	21.11
	75.00	23.89
	80.00	26.67
	85.00	29.45
	90.00	32.22
	95.00	35.00
	100.00	37.78
	105.00	40.56
	110.00	43.34
	115.00	46.11
	120.00	48.89
	125.00	51.67
	130.00	54.45
	135.00	57.23

Fahrenheit	Celsius	
140.00	60.00	
145.00	62.78	
150.00	65.56	
155.00	68.34	
160.00	71.12	
165.00	73.89	
170.00	76.67	
175.00	79.45	
180.00	82.23	
185.00	85.01	
190.00	87.78	
195.00	90.56	
200.00	93.34	
205.00	96.12	
210.00	98.90	
212.00	**100.00**	Boiling Temp.

General conversion formula where:
Tc = Temperature Celsius, and
Tf = Temperature Fahrenheit.

Fahrenheit to Celsius
$Tc = (5/9) \cdot (Tf-32)$

Celsius to Fahrenheit
$Tf = ((9/5) \cdot Tc)+32$

Product Descriptions

Treatment	Description
Bond Coat/Tack Coat – Trackless	An application of emulsion or asphalt binder with trackless properties that is sprayed onto the roadway surface immediately prior to a paving operation. The trackless properties ensure the bonding material stays where it is needed, resisting being picked up by tires, paving equipment and haul trucks and tracked across the job site. Adjacent structures and striping are protected for tracking associated with conventional materials.
Tack Coat – Conventional	An application of emulsion or asphalt binder that is sprayed onto the roadway surface immediately prior to a paving operation. The adhesion of multiple lifts of pavement provides for maximum structural coefficient and ensures the safety and longevity of the pavement structure.
Spray Paver Application	A paving technique whereby the tack or bond coat material is applied through the paving equipment in a continuous operation. Contact your local salesperson for information on availability in your area.
Chip Seal – Conventional	A spray-applied application of asphalt emulsion or binder followed by an application of a single layer of aggregate used to provide friction, seal cracks less than 1/4 inch wide and reduce the intrusion of water into roadway structures. Typically used on more rural routes with low to moderate ADTs. Life extensions of 5 - 7 years are typical.
Chip Seal – Modified	A wearing course of spray-applied polymer modified asphalt emulsion or binder followed by an application of a single layer of aggregate used to provide friction, seal cracks less than 1/4 inch wide and preserve roadways. The modification provides resistance to higher ADT routes and a relatively quick return to traffic. Life extensions of 6 - 7 years are seen.
Chip Seal – Premium	A polymer modified chip seal system designed for maximum aggregate adhesion and the shortest return-to-traffic time for the highest ADT routes. Life extensions of 6 - 7 years are expected.
Rejuvenating Scrub Seal	Surface treatment designed as a mass crack sealer with frictional properties of a chip seal. Used on roadways with high-density, top-down cracking as a wearing course or interlayer. Provides life extension of 6 - 7 years.
Cold Mix – Conventional	Mixture of cutback asphalt or asphalt emulsion and aggregate, combined through a pugmill or asphalt plant and typically stored in a stockpile for use as temporary patching.
Cold Mix – Premium	Laboratory designed mixture of an engineered asphalt or asphalt emulsion binder combined through an asphalt plant or pugmill that is capable of being stored in a stockpile for use as a durable repair of potholes, leveling and cold paving.

Cold In-Place Recycling	Rehabilitation technique. Mills and recycles asphalt mixtures to depths in the range of 3 - 5 inches. Used to correct all pavement distresses within the recycled depth and prevent or delay reflective cracking from deeper in the structure.
Hot In-Place Recycling	In-situ preservation and maintenance technique. Recycles and rejuvenates asphalt mixtures in the top 2 inches. Used to correct cracking, surface profile flaws, raveling and oxidation.
Full Depth Reclamation	A complete rehabilitation technique addressing all major distresses throughout the pavement structure and into the base. All roadway materials are combined in-situ and compacted to form an improved base. This is followed by the appropriate wearing course of asphalt installed to provide the required structural coefficient.
Fog Seal – Conventional	A preservation technique that involves spraying a diluted asphalt emulsion onto an asphalt surface. Used to enhance aggregate retention and seal hairline cracks. Life extensions of 2 - 4 years are typical.

Fog Seal – High-Performance	A light application of emulsion sprayed on the roadway surface, providing a quick return-to-traffic time and improved aggregate retention with trackless properties. Typical uses are over new chip seals, rejuvenating scrub seals and existing pavement surfaces — resulting in increased service life of 2 - 4 years.
Fog Seal – Rejuvenating	A preservation technique that involves spray applying a light application of a polymer modified asphalt emulsion containing a rejuvenator. Typically used to seal cracks 1/8 inch and smaller and to return original properties to the upper portion of an asphalt mixture. Life extensions of 2 - 4 years can be achieved.
Fog Seal – Specialty	A fog seal treatment exhibiting a unique property such as a relatively quick return to traffic, a trackless cure or a polymer modified binder.
Frictional Mastic	Spray-applied surface treatment/sealer designed for city streets, residential roads and highway shoulders. Corrects distresses such as raveling and oxidation. Delivers 2 - 4 years of life extension.

Micro Surfacing – Conventional	Surface treatment/wearing course with standard 3% polymer modification of the asphalt base. Addresses loss of friction, oxidation, rutting and minor reprofiling. Can be used on all roadway types and all traffic levels, providing 6 - 8 years of life extension.
Micro Surfacing – Premium	Surface treatment/wearing course with minimum 6% polymer modification of the asphalt base. Developed for use on all roadway classifications. Uses include rut filling and leveling. It also provides durable friction while resisting damage from snowplows. Typical life extension of minimum of 7 - 9 years.
Slurry Seal – Conventional	Wearing course with no modification to the binder. Used for county roads and city/residential streets, providing 5 - 7 years of life extension.
Slurry Seal – Modified	Wearing course follows conventional slurry seal design and application techniques with added polymer modification of the asphalt base, typically around 1.5%. Addresses loss of friction, raveling and oxidation with a life extension of 4 - 6 years.
Slurry Seal – Premium	Surface treatment/wearing course with minimum 6% polymer modification of the asphalt base and upgraded performance mixture design over the conventional version. Developed for use in city environments where heavy turning and street-side parking are prevalent, as well as in frequent snowplow zones. Protects against vehicular damage early in the curing process and increases durability, providing life extension of 6 - 8 years.

Prime Coat – Conventional	An application of emulsion or asphalt binder to a soil base in preparation for the wearing course. Typical use is prior to a chip seal or hot mixed asphalt application; the prime provides protection of the soil against rainfall in staged construction and serves as a bond promoter for the eventual surface. Prime coats are also used as a curing seal for cement-treated bases.
Prime Coat – Solventless	An ecologically friendly emulsion containing no petroleum solvents, providing a rapid cure that facilitates same-day paving.

Application: Blade Mixing

Recommended Emulsion(s): See product application chart for your location.

Recommended Application Rate: Contingent upon mix design.

Description: Blade mixing is a process of mixing emulsion and aggregate in the windrow using a motorgrader and/or cross shaft mixer. The motorgrader and/or cross shaft mixer blends the material together by a series of turning and tumbling actions. When using a motorgrader, the moldboard must be adjusted to give a rolling action as the blade moves through the windrow. After mixing is completed, the windrow should be moved to the side of the road in preparation for spreading.

Note: A mix design must be completed before attempting blade mixing to determine the emulsion required.

Blade Mixing

Depth	8' Wide	10' Wide	12' Wide	14' Wide	18' Wide	22' Wide	26' Wide	30' Wide
1"	2,400	3,000	3,600	4,200	5,400	6,600	7,800	9,000
2"	4,800	6,000	7,200	8,400	10,800	13,200	15,600	18,000
3"	7,200	9,000	10,800	12,600	16,200	19,800	23,400	27,000
4"	9,600	12,000	14,400	16,800	21,600	26,400	31,200	36,000
5"	12,000	15,000	18,000	21,000	27,000	33,000	39,000	45,000
6"	14,400	18,000	21,600	25,200	32,400	39,600	46,800	54,000
	4,693	5,867	7,040	8,213	10,560	12,907	15,253	17,600

☐ Gallons Required per Mile ☐ Square Yards per Mile

Application: 3/8" Chip Seal

Recommended Emulsion(s): See product application chart for your location.

Recommended Application Rate: 0.36 to 0.50 gallons per square yard, depending on surface conditions.

These rates are determined on a case-by-case basis and many factors contribute to the final shot rate determination. Consult your Ergon Representative or project engineer for more information.

Description: A single or multiple application of emulsion to a road surface, immediately followed by a single or multiple layer of aggregate of as uniform size as practical. The thickness of the chip seal is about the same as the nominal maximum size aggregate. A single chip is used as a wearing and waterproofing course, while a double chip seal provides a denser wearing and waterproofing course.

These rates may vary based on several items, including geography, climate, traffic amount, weather during application, roadway condition, etc. Please contact your local Ergon Asphalt & Emulsions representative for more information.

3/8" Chip Seal

Shot Rate	8' Wide	10' Wide	12' Wide	14' Wide	18' Wide	22' Wide	26' Wide	30' Wide
.36	1,689	2,111	2,534	2,956	3,801	4,646	5,491	6,336
.38	1,736	2,170	2,604	3,038	3,907	4,775	5,643	6,512
.40	1,783	2,229	2,675	3,120	4,012	4,904	5,796	6,688
.42	1,830	2,287	2,745	3,203	4,118	5,033	5,948	6,864
.44	1,877	2,346	2,816	3,285	4,224	5,162	6,101	7,040
	4,693	5,867	7,040	8,213	10,560	12,907	15,253	17,600
26 Lbs. per Square Yard	61	76	91.5	107	137	168	198	228
28 Lbs. per Square Yard	66	82	99	115	148	181	214	246

☐ Gallons Required per Mile ☐ Square Yards per Mile ☐ Tons of Chips per Mile

Application: 5/8" Chip Seal

Recommended Emulsion(s): See product application chart for your location.

Recommended Application Rate: 0.40 to 0.60 gallons per square yard, depending on surface conditions.

These rates are determined on a case-by-case basis and many factors contribute to the final shot rate determination. Consult your Ergon Representative or project engineer for more information.

Description: A single or multiple application of emulsion to a road surface, immediately followed by a single or multiple layer of aggregate of as uniform size as practical. The thickness of the chip seal is about the same as the nominal maximum size aggregate. A single chip is used as a wearing and waterproofing course, while a double chip seal provides a denser wearing and waterproofing course.

These rates may vary based on several items, including geography, climate, traffic amount, weather during application, roadway condition, etc. Please contact your local Ergon Asphalt & Emulsions representative for more information.

5/8" Chip Seal

Shot Rate	8' Wide	10' Wide	12' Wide	14' Wide	18' Wide	22' Wide	26' Wide	30' Wide
.40	1,877	2,346	2,816	2,285	4,224	5,162	6,101	7,040
.44	1,924	2,405	2,886	3,367	4,329	5,291	6,253	7,215
.48	1,971	2,463	2,956	3,449	4,435	5,420	6,406	7,392
.52	2,018	2,522	3,027	3,531	4,540	5,549	6,558	7,568
.54	2,064	2,581	3,097	3,613	4,646	5,678	6,711	7,744
.60	2,111	2,639	3,168	3,695	4,752	5,807	6,863	7,920
	4,693	5,867	7,040	8,213	10,560	12,907	15,253	17,600
26 Lbs. per Square Yard	61	76	91.5	107	137	168	198	228
28 Lbs. per Square Yard	66	82	99	115	148	181	214	246

☐ Gallons Required per Mile ☐ Square Yards per Mile ☐ Tons of Chips per Mile

Application: Dust Control

Recommended Emulsion(s): See product application chart for your location.

Recommended Application Rate: 0.10-0.50 gallons per square yard, depending upon surface conditions.

These rates are determined on a case-by-case basis and many factors contribute to the final shot rate determination. Consult your Ergon Representative or project engineer for more information.

Description: The use of emulsions offers a practical and feasible solution to dust control. A diluted emulsion is sprayed directly on the unpaved surface. The material is applied with a distributor, using usual spray application techniques.

Dust Control

Shot Rate	8' Wide	10' Wide	12' Wide	14' Wide	18' Wide	22' Wide	26' Wide	30' Wide
.10	469	586	704	821	1,056	1,240	1,525	1,760
.20	938	1,173	1,408	1,642	2,112	2,481	3,050	3,520
.30	1,408	1,760	2,112	2,464	3,168	3,721	3,576	5,280
.40	1,877	2,346	2,816	3,285	4,224	4,962	6,101	7,040
.50	2,346	2,933	3,520	4,106	5,280	6,203	7,626	8,800
	4,693	5,867	7,040	8,213	10,560	12,907	15,253	17,600

☐ Gallons Required per Mile ☐ Square Yards per Mile

Application: Fog Seal

Recommended Emulsion(s): See product application chart for your location.

Recommended Application Rate: 0.10-0.20 gallons per square yard, depending on surface conditions.

These rates are determined on a case-by-case basis and many factors contribute to the final shot rate determination. Consult your Ergon Representative or project engineer for more information.

Description: A fog seal is a light application of slow-setting emulsion diluted with water. It is used to renew old asphalt surfaces, seal small cracks and surface voids, and inhibit raveling.

Fog Seal

Shot Rate	8' Wide	10' Wide	12' Wide	14' Wide	18' Wide	20' Wide	26' Wide	30' Wide
.10	469	586	704	801	1,056	1,173	1,525	1,760
.15	704	880	1,161	1,232	1,584	1,760	2,287	2,640
.20	1,079	1,173	1,408	1,642	2,112	2,346	3,050	3,520
	4,693	5,867	7,040	8,213	10,560	11,733	15,253	17,600

☐ Gallons Required per Mile ☐ Square Yards per Mile

Application: Prime Coat

Recommended Emulsion(s): See product application chart for your location.

Recommended Application Rate: 0.10-0.30 gallons per square yard, depending upon surface conditions.

These rates are determined on a case-by-case basis and many factors contribute to the final shot rate determination. Consult your Ergon Representative or project engineer for more information.

Description: A prime coat is an application of low-viscosity emulsion to a granular base in preparation for a chip seal or asphalt surface course. The prime coat is designed to coat and bond loose particles on the base, harden the surface, waterproof the base, plug voids and provide adhesion between the base and the next course.

Prime Coat

Shot Rate	8' Wide	10' Wide	12' Wide	14' Wide	18' Wide	22' Wide	26' Wide	30' Wide
.10	469	586	704	821	1,056	1,240	1,525	1,760
.15	704	880	1,056	1,232	1,584	1,861	2,288	2,640
.20	938	1,349	1,408	1,642	2,112	2,481	3,050	4,048
.25	1,173	1,466	1,760	2,053	2,640	3,101	3,813	4,400
.30	1,408	1,759	2,112	2,464	3,168	3,721	4,576	5,280
	4,693	5,867	7,040	8,213	10,560	12,407	15,253	17,600

☐ Gallons Required per Mile ☐ Square Yards per Mile

Application: Tack Coat

Recommended Emulsion(s): See product application chart for your location.

Recommended Application Rate: 0.05-0.20 gallons per square yard, depending upon surface conditions.

These rates are determined on a case-by-case basis and many factors contribute to the final shot rate determination. Consult your Ergon Representative or project engineer for more information.

Description: A tack coat is a very light application used to ensure a bond between a surface being paved and the new course.

Tack Coat

Shot Rate	8' Wide	10' Wide	12' Wide	14' Wide	18' Wide	22' Wide	26' Wide	30' Wide
.05	234	293	352	410	528	620	762	880
.10	469	586	704	821	1,056	1,240	1,525	1,760
.15	704	880	1,056	1,232	1,584	1,861	2,288	2,640
.20	938	1,173	1,408	1,642	2,112	2,481	3,050	3,520
	4,693	5,867	7,040	8,213	10,560	12,407	15,253	17,600

☐ Gallons Required per Mile ☐ Square Yards per Mile

Key Websites

American Association of State Highway Transportation Officials – AASHTO
transportation.org

American Public Works Association – APWA
apwa.net

American Road & Transportation Builders Association – ARTBA
artba.org

American Society for Civil Engineers – ASCE
asce.org

American Society for Testing and Materials – ASTM
astm.org

Asphalt Emulsion Manufacturers Association – AEMA
aema.org

Asphalt Institute – AI
asphaltinstitute.org

Asphalt Recycling & Reclaiming Association – ARRA
arra.org

Associated Asphalt
associatedasphalt.com

Associated General Contractors – AGC
agc.org

Canadian Technical Asphalt Association – CTAA
ctaa.ca

Emulsion Task Force
pavementpreservation.org/pavement-preservation/emulsion-task-force/

Federal Highway Administration – FHWA
highways.dot.gov

FHWA Construction & Maintenance – FHWA
highways.dot.gov/federal-lands/construction

FHWA Pavement Technology – FHWA
fhwa.dot.gov/innovation/amr/pavement.cfm

Foundation for Pavement Preservation – FP^2
fp2.org

International Slurry Surfacing Association – ISSA
slurry.org

International Road Federation – IRF
irf.global

National Asphalt Pavement Association – NAPA
asphaltpavement.org

National Association of County Engineers – NACE
countyengineers.org

National Center for Pavement Preservation – NCPP
pavementpreservation.org

National Transportation Library – NTL
ntl.bts.gov

Pavement Preservation
savemyroad.com

Pavement Preservation & Recycling Alliance
roadresource.org

Research in Progress – RIP
rip.trb.org

The Asphalt Contractor Online
asphalt.com

The Recycled Materials Resource Center – RMRC
rmrc.wisc.edu

The Road Emulsion Association Ltd
rea.org.uk

The Road Information Program – TRIP
tripnet.org

Transportation Research Board – TRB
nationalacademies.org/trb

Transportation Research Information Service – TRIS
trb.org/InformationServices/InformationServices.aspx

Ergon Asphalt & Emulsions, Inc.
ergonasphalt.com

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associatedasphalt.com

ergonasphalt.com

savemyroad.com

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