Asphalt Preservation 101

Rex Hedges  RejuvTec Inc.

THE NEW WAY WE ALWAYS DID IT

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WE CANNOT SOLVE OUR PROBLEMS WITH THE SAME THINKING WE USED WHEN WE CREATED THEM

- Albert Einstein

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RejuvTec is a state-wide full service Pavement Preservation contractor with over 30 years experience. **We don’t make asphalt pavement, we help you make it last longer...economically.**

We are the Indiana authorized and certified distributor and applicator of Tricor’s Golden Bear Road Preservation Products.
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Tricor Refining, starting as the Golden Bear Oil Company in 1930, markets specialized asphalt rejuvenating and recycling oils and emulsions, along with restorative seats, crack fillers and dust retardants. Tricor Refining Co., purchased in 2001 by Ergon, Inc. and San Joaquin Refining Co., continues stronger than ever with over 3000 employees.

These products are sold world-wide under the trade names: Reclamite, CRF, Cyclogen & Coherex

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Golden Bear Preservation Products developed and patented the specifications for asphalt rejuvenator and recycling oils in the mid 1960’s and 1970’s. These specifications became the specification for ASTM, AASHTO, and West Coast User Producer specifications.
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International Distributors:
Europe
Scandinavia
UK
South America
Mexico
China
Australia
Russia
Argentina

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Canadian Distributors:

British Columbia
Northern Alberta
Northwest Territories
Ontario
Saskatchewan
Southern Alberta
Yukon

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United States Distributors:

Alabama
Alaska
Arizona
Arkansas
California
Colorado
Florida
Georgia
Idaho
Illinois

Indiana
Kansas
Kentucky
Michigan
Missouri
Montana
Nevada
New England
New Mexico

North Carolina
North Dakota
Ohio
Oklahoma
Oregon
South Carolina
Tennessee
Texas
Utah
Wyoming

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Asphalt Cement

Natural Asphalt  Petroleum Asphalt
What is Liquid Asphalt?

LA Brea Asphalt Pits in Los Angeles is one of the few natural asphalt places in the world.
Natural Asphalt

Pitch Lake on Trinidad’s west coast is a 95 acre lake of natural asphalt.
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Oldest Cementing Material

In the ancient eastern Mediterranean countries, the “cradle of civilization,” man cemented his building blocks in place with the Asphalt he found in Asphalt pools. Actually, the ancient art of masonry construction developed around this strong mortar.

Columbus Discovers New Caulking Material

Christopher Columbus, fearless admiral of the seas, dropped anchor in 1498 off the shores of an island he named “La Trinidad.” According to his own log he “careened his galleons and caulked their storm-racked seams with a natural waterproofing substance.” He had discovered Trinidad’s now-famed natural Asphalt Lake.

Asphalt Used in Noah’s Ark

Asphalt is an excellent waterproofing material. The Bible tells us Noah used it to seal his famous Ark.
Petroleum Asphalt is a by-product of refining.
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| 94% = Sand & Stone | 6% = Liquid Binder |

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Asphalt is a black, cementing material that varies widely in consistency...
Asphalt cement is the base material used in the production of both emulsified asphalt and liquid asphalt. The asphalt cement is a dispersion of asphaltenes in a hydrocarbon mixture, which may contain varying amounts of other components such as maltenes. These components can be separated into two major parts called asphaltenes and maltenes.

Asphalt cement is produced from various hydrocarbons and hydrogenated vegetable oils. The composition and performance of asphalt cement are affected by the asphaltene content and its characteristics. These chemical and physical changes are influenced by a number of factors, including temperature, oxygen availability, and aggregate type and asphalt binder properties. As asphalt ages, it becomes harder and more brittle and may lose its adherence or stickiness. Thus, the secret of ensuring a long service life of asphalt pavements is to retard the aging process. This can be achieved by using asphalt additives and using the right aggregate stock. Work is also being done to develop new materials and methods to improve the durability and performance of asphalt pavements.
Asphalt is a black, cementing material that varies widely in consistency from solid to semi-solid at normal air temperatures. It is thermoplastic and when heated sufficiently, softens and eventually becomes liquid. As the temperature rises, asphalt passes from a solid state through a semi-solid plastic state to a liquid state.

Asphalt is produced in large reservoirs and tapped with small amounts of sulfur, oxygen, nitrogen, and other elements. By distilling the asphalt such as the lighter fractions can be separated into two major parts: the asphaltene and the saturates. The asphaltene insoluble in heptanes is solid while separated. They are black or dark brown in color and look something like a pitch which

Asphalt ages, it becomes harder and more brittle and may lose its adhesion or stickiness.
Thus, the secret of ensuring a long service life of asphalt in pavements is to retard the aging process.

Asphalt cement is composed of various hydrocarbons held together by intermolecular forces. When asphalt cement is heated and subjected to oxidative conditions, the hydrocarbons break down, leading to the formation of carbon and hydrogen. These reactions, known as oxidation, cause the asphalt to age and degrade, resulting in a decrease in its performance characteristics.

The aging process can be slowed down by using additives that help prevent the break down of the hydrocarbons. These additives can include polymers, which form a protective layer on the surface of the asphalt, or antioxidants, which help to inhibit the oxidation process.

By retarding the aging process, the service life of asphalt pavements can be extended, reducing the need for frequent repairs and replacements. This not only saves money but also reduces the environmental impact associated with the disposal of old pavement materials.
Components of Asphalt

Asphalt is comprised of two fractional components:

- MALTENES
- ASPHALTENES

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Components of Reclamite

Components of Asphalt.

Reclamite maltene rejuvenator
NO ASPHALTENES

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Reclamite
Is a maltene-based asphalt rejuvenator that:

- Restores chemical properties lost due to weathering and UV rays.
- Restores flexibility and ductility to the top ½” of asphalt pavement.
- Stops aggregate loss of the dry and brittle asphalt pavement.

When the right road is treated at the right time, the result is a highly durable asphalt, virtually equal or better than the original.
“It’s important to get the true, maltene-based rejuvenator if a change in binder chemistry is desired.”

Larry Galehouse
Director, National Center for Pavement Preservation

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Tested and re-tested as part of FP2 Sealer Binder Study, the results of Reclamite asphalt rejuvenator are expected and predictable. As long as you achieve absorption to the pavement, penetration, viscosity DSR modulus changes will be apparent.

Photo taken 10-19-2006
Reclamite treatment 2001.

Location: Winslow, Arizona
Hwy 95; 40 miles north of I-40

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Top of the Curve
Pavement Preservation Strategies
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- Pavement Life Cycle

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Typical Pavement Preservation Treatments

Flexible Pavement Treatments

- Asphalt Rejuvenators
- Asphalt Sealers
- Crack Sealing
- Crack Filling
- Scrub Seals
- Sand Seals
- Chip Seals
- Cape Seals
- Slurry Seals
- Micro-surfacing
- Ultra-thin Overlays
- Bonded Wearing Course
- Profile Milling
- Ultra-Thin Overlays (generally ≤ ¾ inch)
- Thin Overlays (non-structural, generally ≤ 1½ inch)
- Mill & Resurface (non-structural, generally ≤ 1½ inch)
- Hot In-place Recycling
- Cold In-place Recycling
- …certain proprietary treatments

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The Problem:
While modern asphalt mixes may meet current standards and specifications, manufacturing processes have changed significantly. When pavement “glue” is pre-oxidized during the hot-mix production it is highly susceptible to further degradation through oxidation, friction wear and traffic volume.

The Solution – Asphalt Preservation:
For $1 spent on Preservation, up to $11 is saved by reducing replacement costs and extending pavement life.
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What is an Asphalt Rejuvenator?

An asphalt rejuvenator is a maltene based solution used to prolong the life of asphalt. It restores and preserves the plasticity and durability in asphalt.
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Slurry Seal
Micro-surfacing
Chip & Seal are all topical treatments.

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Maltene Rejuvenator

Reclamite maltene rejuvenator
Penetrates +/- 3/8 inch, densifying the surface creating an **in-depth** seal

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The Language of Pavement Preservation
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PRESERVATION VS. MAINTENANCE

“...Long term strategy that enhances pavement...extends pavement life, improves safety and meets motorist expectations.”
Source: FHWA Pavement Preservation Expert Task Group

“...consists of work that is planned and performed on a routine basis to maintain and preserve the condition of the highway system or to respond to specific conditions and events that restore the highway system to an adequate level of service.”
Source: AASHTO Highway Subcommittee on Maintenance

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PROACTIVE VS. REACTIVE

Controlling a situation by making things happen or by preparing for possible future problems.

Serving to prepare for, intervene in, or control an expected occurrence or situation.

Tending to initiate change rather than reacting to events.

Done in response to a problem or situation.

Reacting to problems when they occur instead of taking action to prevent them.
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NETWORK VS. PROJECT

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BOD - Born on Date

DSL – Design Service Life

RSL – Remaining Service Life

CSL – Critical Service Life

ESL – Extended Service Life

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Pavement Preservation Begins with Rejuvenation!

Reclamite® Rejuvenating Agent

Asphalt Pavement Preservation
www.rejuvtec.com • 800-550-5330

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Kiss Your Potholes Goodbye!

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Photo Gallery
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Daviess County

Test patch for coring

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We verify the asphalt will be rejuvenated and determine how much to use. We take “before and after” core samples to measure penetration and viscosity variations.

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Tippecanoe County
Photo taken 2012
Road treated 2010

2015 Purdue Road School – RejuvTec Inc. & City of Franklin
Photo taken 4-14-11
Reclamite treatment in 2010.
Location: Daviess County, IN
CR 475 E paved in 2009.

After One Year

Treated

Untreated

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Daviess County

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Daviess County

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Czech Republic

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Angola, Indiana

Treated 2004

Untreated

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 China

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Holland

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Subdivision Roads

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Johnson County

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Treated

Untreated

Photo taken 4-15-11
Paved in 2007.
Reclamite treatment in 2010.
Location Auburn, IN

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Morgan County

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Asphalt Rejuvenators can also be used to preserve a road’s rumble strips.
FRANKLIN, INDIANA

The City of Franklin is located in Johnson County approximately 20 miles south of Indianapolis.

The city is the county seat for Johnson county and the site of Franklin College.

Population approximately 25,000.

Road Network 192 lane miles valued at $17 million
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Mayor Joe McGuinness
City Engineer Travis Underhill P.E.

FRANKLIN, INDIANA

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