THE NEW WAY WE ALWAYS DID IT
“FROM HURDLES TO ACCOLADES”

Asphalt Preservation 101
Rex Hedges  RejuvTec Inc.
THE NEW WAY WE ALWAYS DID IT
“FROM HURDLES TO ACCOLADES”

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

- Albert Einstein

2015 Purdue Road School – RejuvTec, Inc. & City of Franklin
THE NEW WAY WE ALWAYS DID IT

“FROM HURDLES TO ACCOLADES”

2015 Purdue Road School – RejuvTec, Inc. & City of Franklin
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.

2015 Purdue Road School – RejuvTec Inc. & City of Franklin
THE NEW WAY WE ALWAYS DID IT

“FROM HURDLES TO ACCOLADES”

2015 Purdue Road School – RejuvTec Inc. & City of Franklin
**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**

2015 Purdue Road School – RejuvTec Inc. & City of Franklin
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.
THE NEW WAY WE ALWAYS DID IT
“FROM HURDLES TO ACCOLADES”

International Distributors:
Europe
Scandinavia
UK
South America
Mexico
China
Australia
Russia
Argentina

2015 Purdue Road School – RejuvTec Inc. & City of Franklin
THE NEW WAY WE ALWAYS DID IT

“FROM HURDLES TO ACCOLADES”

Canadian Distributors:

British Columbia
Northern Alberta
Northwest Territories
Ontario
Saskatchewan
Southern Alberta
Yukon

2015 Purdue Road School – RejuvTec Inc. & City of Franklin
THE NEW WAY WE ALWAYS DID IT
“FROM HURDLES TO ACCOLADES”

United States Distributors:

<table>
<thead>
<tr>
<th>Alabama</th>
<th>Indiana</th>
<th>North Carolina</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alaska</td>
<td>Kansas</td>
<td>North Dakota</td>
</tr>
<tr>
<td>Arizona</td>
<td>Kentucky</td>
<td>Ohio</td>
</tr>
<tr>
<td>Arkansas</td>
<td>Michigan</td>
<td>Oklahoma</td>
</tr>
<tr>
<td>California</td>
<td>Missouri</td>
<td>Oregon</td>
</tr>
<tr>
<td>Colorado</td>
<td>Montana</td>
<td>South Carolina</td>
</tr>
<tr>
<td>Florida</td>
<td>Nevada</td>
<td>Tennessee</td>
</tr>
<tr>
<td>Georgia</td>
<td>New England</td>
<td>Texas</td>
</tr>
<tr>
<td>Idaho</td>
<td>New Mexico</td>
<td>Utah</td>
</tr>
<tr>
<td>Illinois</td>
<td></td>
<td>Wyoming</td>
</tr>
</tbody>
</table>

2015 Purdue Road School – RejuvTec Inc. & City of Franklin
THE NEW WAY WE ALWAYS DID IT

“FROM HURDLES TO ACCOLADES”

Asphalt Cement

- Natural Asphalt
- Petroleum Asphalt
THE NEW WAY WE ALWAYS DID IT
“FROM HURDLES TO ACCOLADES”

What is Liquid Asphalt?

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

2015 Purdue Road School – RejuvTec Inc. & City of Franklin
Natural Asphalt

Pitch Lake on Trinidad’s west coast is a 95 acre lake of natural asphalt.
THE NEW WAY WE ALWAYS DID IT
“FROM HURDLES TO ACCOLADES”

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 “cared for 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.

2015 Purdue Road School – RejuvTec Inc. & City of Franklin
Petroleum Asphalt is a by-product of refining.
THE NEW WAY WE ALWAYS DID IT
“FROM HURDLES TO ACCOLADES”

2015 Purdue Road School – RejuvTec Inc. & City of Franklin
THE NEW WAY WE ALWAYS DID IT

“FROM HURDLES TO ACCOLADES”

94% = Sand & Stone  6% = Liquid Binder

2015 Purdue Road School – RejuvTec Inc. & City of Franklin
Asphalt is a black, cementing material that varies widely in consistency...
Asphalt is a black, cementing material that sets rigidly 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 falls, asphalt passes from a semi-solid state through a solid, glassy state to a liquid state.

Asphalt cement is asphalt that is refined to meet specifications for paving industrial and special purposes. It is produced from petroleum or crude oils—those coming from around the world. The composition of these asphalt varies considerably. Differences are found not only between oil fields but also between the wells or shale in the same field. In most cases, asphalt cement meeting specifications requirements can be refined from a single source oil, but most often, crude oil from two or more sources are blended to produce an asphalt meeting the required specifications.

Asphalt cement is the base material used in the production of both emulsified asphalt and black asphalt—cultivated asphalt being a dispersion of few droplets of asphalt cement in water, while asphalt being asphalt cement diluted with a petroleum solvent. This publication therefore deals with the characteristics of asphalt cements.

Composition and Performance of Asphalt

Asphalt cement is comprised of various hydrocarbons and hydrocarbon-related compounds, which...
Asphalt is a black, cementing material that is widely used 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 phase to the liquid state.

Asphalt contains various components, including asphaltene, resins, and saturates. It may also contain minor amounts of sulfur, oxygen, nitrogen, and other elements. By classifying the components such as resins, asphalt can be separated into two major parts: asphaltic compounds and saturates.

Asphalt is widely used in the construction of roads, pavements, and other infrastructures. It provides a strong bond between the aggregate and the surface, ensuring durability and longevity.

Asphalt ages, it becomes harder and more brittle and may lose its adhesion or stickiness. This can lead to various issues, such as cracking and degradation, which may require maintenance or repair.

Understanding the properties and characteristics of asphalt is crucial for effective road construction and maintenance.
Thus, the secret of ensuring a long service life of asphalt in pavements is to retard the aging process.
Petroleum Asphalt is comprised of two fractional components:

MALTENES and ASPHALTENES
THE NEW WAY WE ALWAYS DID IT
"FROM HURDLES TO ACCOLADES"

Components of Reclamite

Components of Asphalt.

Reclamite maltene rejuvenator
NO ASPHALTENES

2015 Purdue Road School – RejuvTec Inc. & City of Franklin
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
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

2015 Purdue Road School – RejuvTec Inc. & City of Franklin
THE NEW WAY WE ALWAYS DID IT
“FROM HURDLES TO ACCOLADES”

Top of the Curve
Pavement Preservation Strategies
THE NEW WAY WE ALWAYS DID IT
“FROM HURDLES TO ACCOLADES”

• Pavement Life Cycle

2015 Purdue Road School – RejuvTec Inc. & City of Franklin
THE NEW WAY WE ALWAYS DID IT
“FROM HURDLES TO ACCOLADES”

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 ≤ ¼ 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

2015 Purdue Road School – RejuvTec Inc. & City of Franklin
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.
THE NEW WAY WE ALWAYS DID IT

“FROM HURDLES TO ACCOLADES”

2015 Purdue Road School – RejuvTec Inc. & City of Franklin
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.
THE NEW WAY WE ALWAYS DID IT

“FROM HURDLES TO ACCOLADES”

Slurry Seal
Micro-surfacing
Chip & Seal are all topical treatments.

2015 Purdue Road School – RejuvTec Inc. & City of Franklin
THE NEW WAY WE ALWAYS DID IT

"FROM HURDLES TO ACCOLADES"

Maltene Rejuvenator

Reclamite maltene rejuvenator

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

2015 Purdue Road School – RejuvTec Inc. & City of Franklin
THE NEW WAY WE ALWAYS DID IT

“FROM HURDLES TO ACCOLADES”

The Language of Pavement Preservation
THE NEW WAY WE ALWAYS DID IT
“FROM HURDLES TO ACCOLADES”

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
## The New Way We Always Did It

**“From Hurdles to Accolades”**

<table>
<thead>
<tr>
<th>PROACTIVE</th>
<th>VS.</th>
<th>REACTIVE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Controlling a situation by making things happen or by preparing for possible future problems.</td>
<td>Done in response to a problem or situation.</td>
<td>Reacting to problems when they occur instead of taking action to prevent them.</td>
</tr>
<tr>
<td>Serving to prepare for, intervene in, or control an expected occurrence or situation.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tending to initiate change rather than reacting to events.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
THE NEW WAY WE ALWAYS DID IT
“FROM HURDLES TO ACCOLADES”

NETWORK VS. PROJECT

2015 Purdue Road School – RejuvTec, Inc. & City of Franklin
THE NEW WAY WE ALWAYS DID IT

“FROM HURDLES TO ACCOLADES”

BOD - Born on Date

DSL – Design Service Life

RSL – Remaining Service Life

CSL – Critical Service Life

ESL – Extended Service Life

2015 Purdue Road School – RejuvTec, Inc. & City of Franklin
THE NEW WAY WE ALWAYS DID IT
“FROM HURDLES TO ACCOLADES”

Pavement Preservation Begins with Rejuvenation!

Reclamite® Rejuvenating Agent

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

2015 Purdue Road School – RejuvTec, Inc. & City of Franklin
THE NEW WAY WE ALWAYS DID IT
“FROM HURDLES TO ACCOLADES”

2015 Purdue Road School – RejuvTec, Inc. & City of Franklin
THE NEW WAY WE ALWAYS DID IT
“FROM HURDLES TO ACCOLADES”

Photo Gallery
THE NEW WAY WE ALWAYS DID IT
“FROM HURDLES TO ACCOLADES”

Daviess County

Test patch for coring

2015 Purdue Road School – RejuvTec Inc. & City of Franklin
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.
THE NEW WAY WE ALWAYS DID IT
“FROM HURDLES TO ACCOLADES”

Tippecanoe County

Photo taken 2012
Road treated 2010

2015 Purdue Road School – RejuvTec Inc. & City of Franklin
THE NEW WAY WE ALWAYS DID IT
“FROM HURDLES TO ACCOLADES”

Photo taken 4-14-11
Reclamite treatment in 2010.
Location: Daviess County, IN
CR 475 E paved in 2009.

2015 Purdue Road School – RejuvTec Inc. & City of Franklin
THE NEW WAY WE ALWAYS DID IT
“FROM HURDLES TO ACCOLADES”

Daviess County

2015 Purdue Road School – RejuvTec Inc. & City of Franklin
Daviess County

2015 Purdue Road School – RejuvTec Inc. & City of Franklin
THE NEW WAY WE ALWAYS DID IT

“FROM HURDLES TO ACCOLADES”

Czech Republic

2015 Purdue Road School – RejuvTec Inc. & City of Franklin
China

2015 Purdue Road School – RejuvTec Inc. & City of Franklin
THE NEW WAY WE ALWAYS DID IT
“FROM HURDLES TO ACCOLADES”

Holland

2015 Purdue Road School – RejuvTec Inc. & City of Franklin
THE NEW WAY WE ALWAYS DID IT

“FROM HURDLES TO ACCOLADES”

Subdivision Roads

2015 Purdue Road School – RejuvTec Inc. & City of Franklin
THE NEW WAY WE ALWAYS DID IT
“FROM HURDLES TO ACCOLADES”

Johnson County

2015 Purdue Road School – RejuvTec Inc. & City of Franklin
THE NEW WAY WE ALWAYS DID IT
“FROM HURDLES TO ACCOLADES”

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

2015 Purdue Road School – RejuvTec Inc. & City of Franklin
THE NEW WAY WE ALWAYS DID IT
“FROM HURDLES TO ACCOLADES”

2015 Purdue Road School – RejuvTec Inc. & City of Franklin
THE NEW WAY WE ALWAYS DID IT
"FROM HURDLES TO ACCOLADES"

Morgan County

2015 Purdue Road School – RejuvTec Inc. & City of Franklin
Asphalt Rejuvenators can also be used to preserve a road’s rumble strips.
THE NEW WAY WE ALWAYS DID IT

“FROM HURDLES TO ACCOLADES”

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

2015 Purdue Road School – RejuvTec, Inc. & City of Franklin
THE NEW WAY WE ALWAYS DID IT
“FROM HURDLES TO ACCOLADES”

Mayor Joe McGuinness
City Engineer Travis Underhill P.E.

FRANKLIN, INDIANA

2015 Purdue Road School – RejuvTec, Inc. & City of Franklin