



EVO THERM

WARM MIX ASPHALT TECHNOLOGY

Evotherm

What is it?

- Chemical additive package
- Optimized to deliver
 - Mixing
 - Coating
 - Workability
 - Compaction
 - Adhesion

Evotherm Emulsion

How does it work?

- Evotherm Emulsion Technology (ET)
 - High-residue asphalt emulsion
 - Delivered at 0.5% by emulsion weight

Evotherm DAT

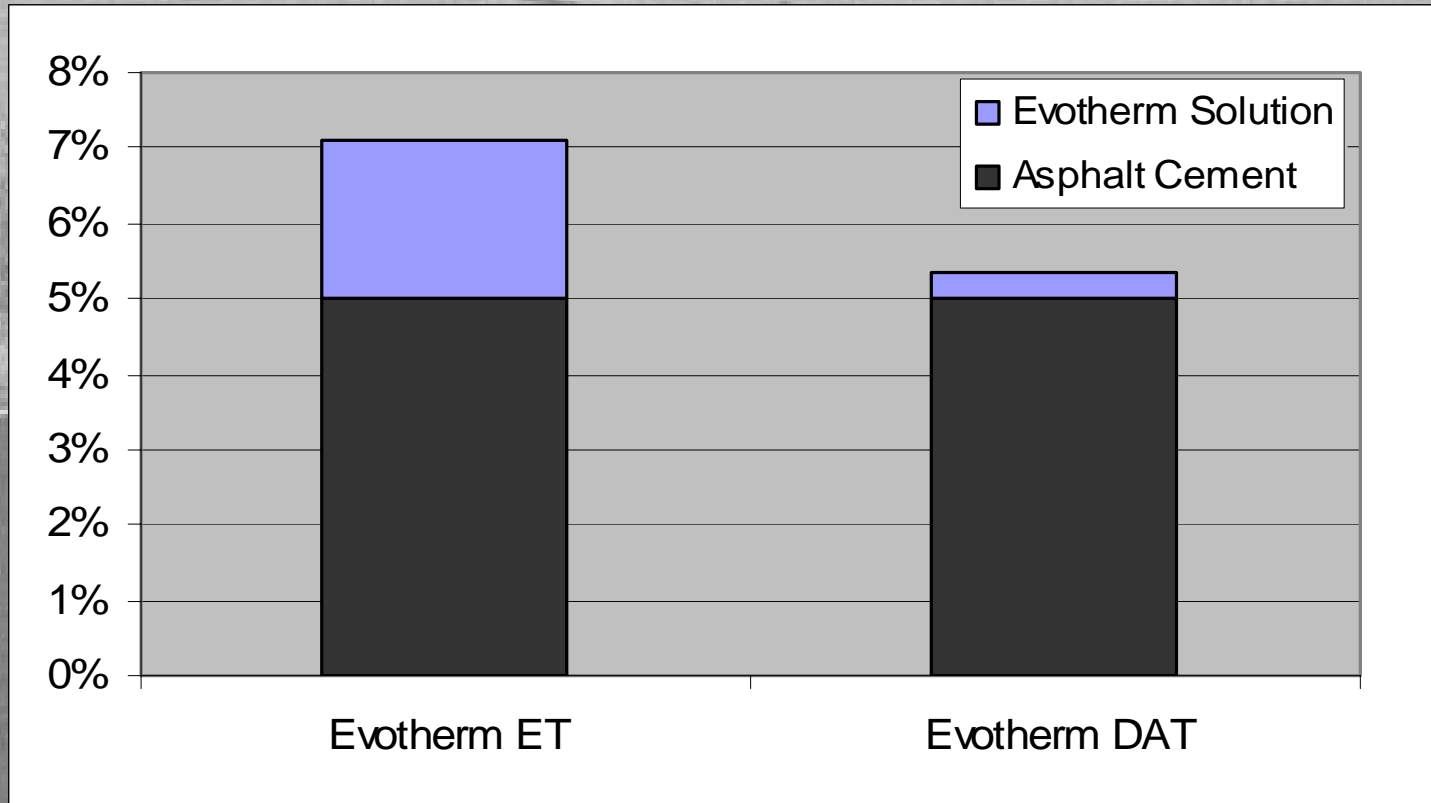
How does it work?

- Evotherm Dispersed Asphalt Technology (DAT)
 - Same chemistry as Evotherm ET
 - Chemical concentrate directly injected into asphalt line at plant
 - DAT concentrate delivered at ~5% by asphalt weight

Evotherm DAT



Evotherm Composition




Evotherm

How does it work?


- Effective temperature range
 - Mix temperature
 - 250-170°F
 - Compaction temperature
 - 235-160°F

Typical Application Temperature

~100°F less than Hot Mix



201



296

EVOTHERM

Hot Mix

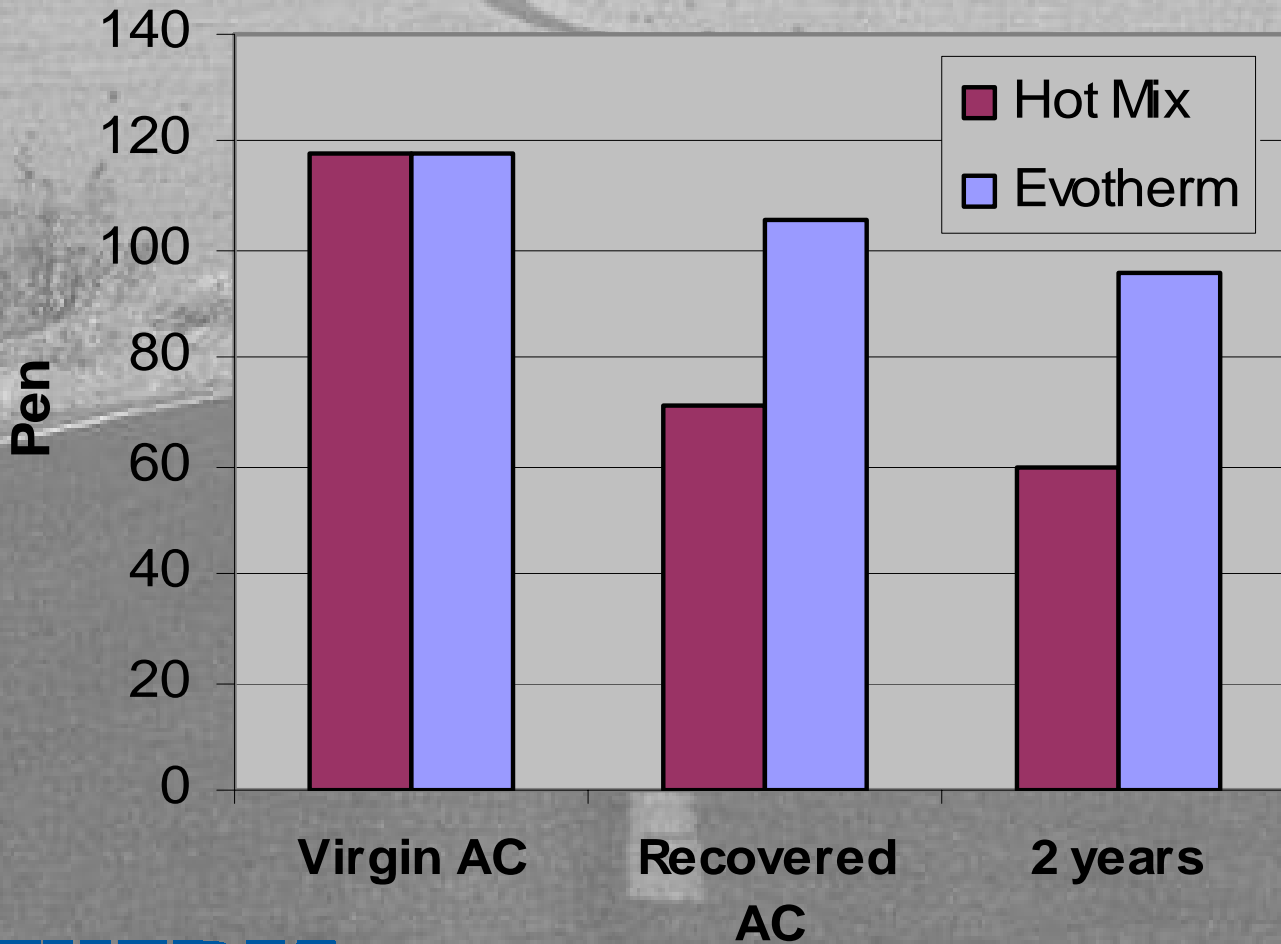
Where are we now?

- 45 Projects in 2007;
 - 70+ projects to date
- >80,000 tons in 2007;
 - 100,000+ tons to date
- Evotherm paved in 17 states;
 - 5 Canadian provinces
 - France, Spain, South Africa, Mexico, & China

Recent Evotherm Developments

- New Chemistries
 - 6 different options available
- Dosage rate optimization
 - Original dosage rate – 11oz/Ton
 - Current dosage rate – 5 oz/Ton
- Water-free Evotherm
- Longer binder life

Binder Hardening



NCAT Test Track

1.1 mm



0.9 mm



0.9 mm



← 9.5 mm NMAS →

1"

HMA Control PG 67-22

Evotherm PG 76-22

Evotherm PG 67-22

2"

19.0 mm NMAS w/
Evotherm PG 67-22

E9

2"

19.0 mm NMAS w/
Evotherm PG 67-22

$N_{\text{design}} = 80$
for all mixes

N2

N1

600,000 ESALS

NCAT Test Track



1"	HMA Control PG 67-22	Evotherm PG 76-22	Evotherm PG 67-22
2"	19.0 mm NMAS w/ Evotherm PG 67-22		5,600,000 E9 ESALs
2"	19.0 mm NMAS w/ Evotherm PG 67-22		

$N_{\text{design}} = 80$
for all mixes

N2 N1



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