LOW ENERGY ASPHALTS LEA® FOR SUSTAINABLE ROAD CONSTRUCTION

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Energetic & environmental stakes

HWMA_LEA® mixes
(50% energy savings)
Traditional HMA production

- **Total drying**: 180°C
- **Coating**: 160°C
- **Stockage**: 150°C
- **Application**: 130-140°C

**LEA® process (90°C, covered by 3 patents)**

- Matching any asphalt plant configuration
- Enabling energy savings up to 50% (≈3L fuel/ton of mix)
- Enabling a reduction in CO₂ emissions to the same extent (≈9kg CO₂/ton of mix)
PRIX AIPCR 2007
PIARC PRIZES

Développement durable
Sustainable Development

attribué à / awarded to:
François OLARD & Claude LE NOAN (France)

pour leur mémoire intitulé / for their essay entitled,
Les Enrobés à Basse Température
Low energy asphalt

Fait à Paris, le

Claude Van Rooten
Président du Jury international
Chair of International Jury

Colin Jordan
Président de l’AIPCR
PIARC President

Prix parrainé par la Suisse / Prize sponsored by Switzerland
Below 100°C, the residual humidity of aggregates makes the bitumen foam
Production on traditional plants

Example of drum mix plant
Key figures

350 road works
400 000 tons
Pure & SBS modified binders

France: 30 LEA® plants
Spain: 4 LEA® plants
Portugal: 1 LEA® plant
USA: 3 LEA® plants
New Zealand: 2 LEA® plants
Lab evaluation of LEA® performances

- Workability: **Nynas workability tester**

- Water resistance: **Duriez test**

- Compacting ability: **Gyratory shear compactor**

- Resistance to rutting at 60°C: **Wheel tracking test**

- Complex modulus test on field cores: **IDT**

- Fatigue test (*optional*)
Factorial Experimental Design:
Optimization of the moisture resistance i/C
Bitumen aging: Pen after recovery

[Gaudefroy et al., ISAP 08]

Slight aging in the case of LEAs
Effect of manufacturing process on Emission Potential

Lower Emissions in the case of LEAs

TOC(e) and Emission Potential are lower in the case of HWMAs
Correlation between aging & fume emissions

[Gaudefroy et al., ISAP 08]
Some of our past LEA®
road works…
Aerodrome near Béziers (4000T)
AREA Highway A41: Test section 2007 (700T with PMB’s)
4000-ton roadwork near Toulouse with up to 50% RAP

⇒ RAP capability
What did we learn on the field?

**Fumes are overwhelmingly reduced at laydown**

NY State (USA)
What did we learn on the field?

Quick turnover to traffic
What did we learn on the field?

Less soiling of equipment (plant, truck, paver, shovel) ⇒ reduced use of solvents
What did we learn on the field?

**Improvement of working conditions for workers**

Less embarrassment for residents as well
- Innovative LEA technology
  + at intermediate temperatures between the current cold mix and hot mix asphalt techniques
  + up to 50% energy savings
  + with the performance of HMAs

- 400,000 tons since 2005 with either low or high traffic

- Implementation of the process in other countries (validity with other materials, climates & mix design methods)
Thank you for your attention!
http://www.lea-co.com
Touching is believing….65°C