Portuguese Road Congress 2006

Beneath the Surface

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Presentation Outline

Advances in bituminous pavements:

- The Benefits of Asphalt
- Ensuring Health & Safety

Building for the next ten years and well beyond..
The Benefits of Asphalt

Built to last

- Modern design: 40+ years life-span, with proper maintenance even longer

Solid base course with protective, replaceable wearing course

Sales of hard bitumen (pen ≤ 35/50) in France (% of total bitumen sales) (Source: GPB)
The Benefits of Asphalt

Environmentally friendly

- Asphalt is 100% recyclable
- Saves virgin material, saves transportation
Energy Efficient

Life Cycle Inventory (LCI) calculations show asphalt pavements are the most energy efficient solutions *

Cost effective

Initial investment needed to meet initial traffic loads only, additional only as required later

Rapid and flexible maintenance options

- IVL report: Life Cycle Assessment of Road (H. Stripple 2001)
- Energy involved in construction materials and procedures (Woodrow J. TRB: Halstead 1981)
- AI: Energy Requirements for Roadway Pavements (1975)
Noise reduction

- Standard asphalt – less than half the noise of concrete
- Porous pavements – for even quieter roads

<table>
<thead>
<tr>
<th>Noise Source</th>
<th>Decibel Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jackhammer</td>
<td>100 dB</td>
</tr>
<tr>
<td>Stones</td>
<td>&gt; 82 dB</td>
</tr>
<tr>
<td>Concrete</td>
<td>81 dB</td>
</tr>
<tr>
<td>Standard asphalt</td>
<td>77 dB</td>
</tr>
<tr>
<td>Porous asphalt</td>
<td>74 dB</td>
</tr>
<tr>
<td>Silent asphalt</td>
<td>&lt; 72 dB</td>
</tr>
</tbody>
</table>

Note: 3 dB higher is twice as much noise
The forthcoming IARC* Monograph Review is the focus of the bitumen and asphalt industry today. Producers and users are globally pooling resources to research, evaluate and communicate results based on sound science.

*International Agency for Research On Cancer, a WHO Agency.
Industry Preparations

- Bitumen producers and users are preparing on a global basis:
  1. Industry description
  2. Research: IARC NCC and other studies
  3. Health Symposium
  4. Bibliography

- Eurobitume taking a leading role
Research Underway

Major European studies

- **Inhalation Study (Fraunhofer)**
  - focus on fumes / occupational exposure
- **Nested Case Control (IARC)**
  - clarifying prior results / confounding factors
- **Human Exposure Study (BGFA)**
  - linking animal data to humans / work place studies

Ensuring Health & Safety
Ensuring health & safety

- Bitumen – Safe product for intended use

But

- Some past practices require special care…
Coal Tar in Bituminous Mixtures

- Similar in appearance - quite different in hazard

**Coal Tar**
Produced from destructive distillation of coal

EU Category 1 Proven Human Carcinogen

**Refined Bitumen**
Produced from crude oil

- Not classified at EU level
- Eurobitume recommends No Classification

Bitumen *

* The 9 bitumen substance entries in EINECS

Ensuring Health & Safety
Regulatory issues, Implications

- Requirements for health monitoring of workers exposed to carcinogens
- Requirement to substitute with less hazardous materials where possible
- Reclaimed asphalt products may be contaminated with coal tar
Conclusion

Asphalt means

- Practical solutions, right here, right now
- Perfect for any number of applications
- Quality of life, noise reduction, minimum disruptions, flexible maintenance solutions, increased mobility
- Responsible commitment to the future
Beneath the Surface

Bituminous Pavements

To Learn More

Please accept our invitation to the
International Bitumen Health Symposium
Dresden 7 & 8 June 2006

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IV Eurasphalt & Eurobitume Congress
Copenhagen 21 – 23 May 2008