The Portuguese Approach on Implementation of Harmonised European Asphalt Standards

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London, 13 March 08
SUMMARY

• Portuguese vs. European Standards

• What Changes?

• Portuguese Design Methodology

• Conclusions: Impacts
Pyramid of demands

1. User demands
2. Functional behaviour
3. Structural performance
4. Characteristics of pavement materials (bituminous mixtures, ...)
5. Properties of base materials (bitumen, aggregates, ...)

CT 129/SC1
CT 153/SC1
CT 154/SC1
## ASPHALT CONCRETE - EN 13108-1

<table>
<thead>
<tr>
<th>Pavement Course</th>
<th>Previous Designation</th>
<th>Current Designation (according EN 13108-1)</th>
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<tbody>
<tr>
<td>Base</td>
<td>Macadame Betuminoso Fuso B</td>
<td>AC 32 base ligante (MB)</td>
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<tr>
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<td>Macadame Betuminoso Fuso A</td>
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<td>AC 20 base ligante (MBAM)</td>
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<td>AC 16 bin ligante (MBAM)</td>
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<td>Betão Betuminoso Subjacente</td>
<td>AC 14 bin ligante (BBsb)</td>
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<td>Betão Betuminoso Rugoso</td>
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<td>(micro)Betão Betuminoso Rugoso</td>
<td>AC 10 surf ligante (BBr)</td>
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</table>

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OTHER EUROPEAN BITUMINOUS MIXTURES

- **EN 13108 - 2**
  - Asphalt concrete for very thin layers
    - Betão betuminoso rugoso com granulometria descontínua ou betão betuminoso contínuo

- **EN 13108 - 3**
  - Soft asphalt - NOT USED

- **EN 13108 - 4**
  - Hot rolled asphalt - NOT USED

- **EN 13108 - 5**
  - Stone mastic asphalt (SMA) - STARTING
OTHER EUROPEAN BITUMINOUS MIXTURES

• **EN 13108 – 6**
  • Mastic Asphalt
  • Mástique betuminoso

• **EN 13108 – 7**
  • Porous asphalt – VERY USED, AT RAINY REGIONS OR FOR NOISE REDUCTION PURPOSES

• **EN 13108 – 8**
  • Reclaimed asphalt – USED AS A CONSTITUENT IN RECYCLING TECHNIQUES
Evaluation of Conformity

- **EN 13108 - 20**
  - Type Testing - ITT

- **EN 13108 - 21**
  - Factory Production Control - FPC
**WHAT'S CHANGING**

- **GRADING**
  - Basic sieve set + set 2
  - Expressing grading in terms of 1,4 D; D; 2 mm; 0,063 mm.
  - Characteristic intermediate coarse and fine sieve, depending on the mixture.
  - Extra-optional sieve (between D and 2 mm; between 2mm and 0,063 mm), depending on the mixture.

<table>
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<th>Basic Sieve Set + Set 2 (mm)</th>
<th>AC20 base binder (MB)</th>
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</table>
**AC 32 base binder (MB 0/37,5 Fuso B)**

![Graph showing the AC 32 base binder performance](image)

- Macadame Fusos B
- AC 32
- EP/BRISA
- EN 13108-1

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AC 20 base binder (MB 0/37,5 Fuso A)

Macadame Fusio A
AC 20

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AC 20 base binder (High Modulus)
AC 16 bin binder (High Modulus)

Mistura de Alto Módulo
AC 16
**AC 20 bin binder (MBD)**

**Mistura Betuminosa Densa**

**AC 20**

![Graph showing the relationship between Mistura Betuminosa Densa and AC 20 bin binder (MBD)]
AC 14 surf binder (BB)

Betão Betuminoso Desgaste
AC 14
REQUIREMENTS AND APPROACHES FOR AC

- EVALUATION OF CONFORMITY AND CE MARKING
  - LEVEL 1 - EMPIRICAL APPROACH
    EXPECTED TO CHANGE FOR LEVEL 2 WITHIN THE NEXT 3-5 YEARS
  - LEVEL 2 - FUNDAMENTAL APPROACH
    TO START IN A NEAR FUTURE

- CONTRACT DOCUMENTS (SHW)
  - LEVEL 1 - EMPIRICAL REQUIREMENTS
    - FOR THE MAJORITY OF WORKS
  - LEVEL 2 - FUNDAMENTAL REQUIREMENTS
    - DEPENDING ON THE NETWORK IMPORTANCE;
    - JOB SIZE.
SELECTIONS MADE

• EVALUATION OF CONFORMITY AND CE MARKING

- LABORATORY COMPOSITION VALIDATION (INSTEAD OF PRODUCTION COMPOSITION)

- SINGLE RESULT METHOD (INSTEAD OF THE MEAN OF FOUR RESULT METHOD)
PORTUGUESE MIX DESIGN METHODOLOGY

Level 1
- Selection and identification of components
  - Choice: gradation & binder content
  - Compactability test (Impact)

Level 2
- Marshall Tests
  - Rutting test

Level 3 (OPTIONAL)
- Modulus test

Level 4 (OPTIONAL)
- Fatigue test
  - Formulation selected

Compaction
  - Water sensitivity

Rutting
  - Stiffness
  - Fatigue

 DEPENDING ON THE NETWORK IMPORTANCE, JOB SIZE...
WHAT IS INTENDED

• **NO duplication** of work for CE Marking and for Specification for Highway Works Compliance purposes

• **Specification for Highway Works** may be **more demanding**:
  
  - **Product Control Tests Frequency**
  - **Performance tests (stiffness and fatigue)**
    
    • **Work complexity**
    • **Work Importance**
QUESTIONS

• Necessary a new audit of a NB always a mobile plant is re-located?

• If a mobile plant has a serious malfunction, the producer must ask an extraordinary audit to a NB?
CONCLUSIONS

- Need to review Contractual Documents

- Special work when defining requirements within fundamental approach
THANK YOU VERY MUCH FOR YOUR ATTENTION!