

LISBOA 2010
MAY 25/28
16th World Meeting

Theme n°3 : Workshop 3.2

Energy and resources saving : applications

President: Ana Christina MARTINS (EP)

Moderator : Christine LEROY (EAPA)



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- Papers

- Warm mix asphalt :

- technologies: 3 (N°579, 345, 142)
- Lab evaluation: 1 (N°42)

- Resources saving:

- Cold in-place recycling solutions: 1 (N°565)
- Warm mixes with RAP : 4 (N°93, 282, 144, 149)

- Manufacturing facilities : 1 (N°148)

Study of additives to reduce the viscosity of the binder at high temperatures

Paper N°579 : REDONDO Santiago, AMOR José Ignacio, FELIPO Jesus, COSTA Andrés, CORTES Christian, PAEZ Antonio, VALOR Fernando, POTTI Juan José

- WMA benefits
- Additives studied
- Experimental methods
- Projet Fénix

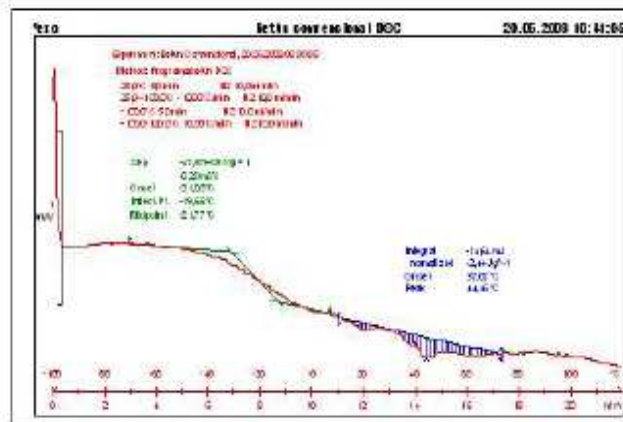


Figure 3. DSC Bitumen 60/70

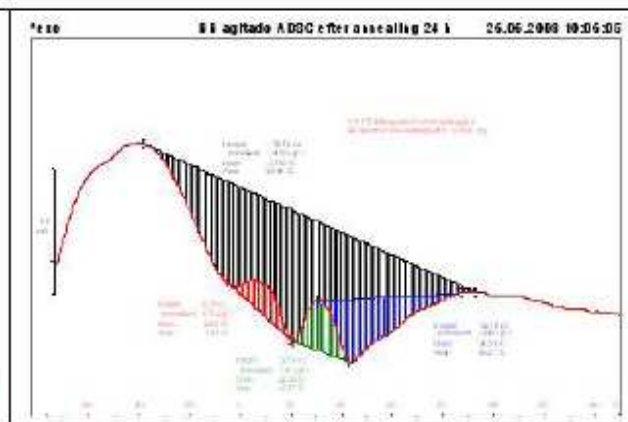


Figure 4. ADSC non-reversing B 60/70



Energy and resources saving: applications

Warm mix asphalt with ASPHA-MIN®

Paper N°345 : VON DEVIVERE Max , JUNOLD Robert

- Description of the process
- Reduction of emissions
- Workability and performance
- User characteristics

Energy and resources saving: applications

Low energy and low emission asphalts for sustainable road construction

Paper N° 142 : OLARD François, BEDUNEAU Etienne, FALLONE David,
MIRANDA PEREZ Lucia

- Basic principle of the LEA process
- Worksite validation and a special case study in laboratory

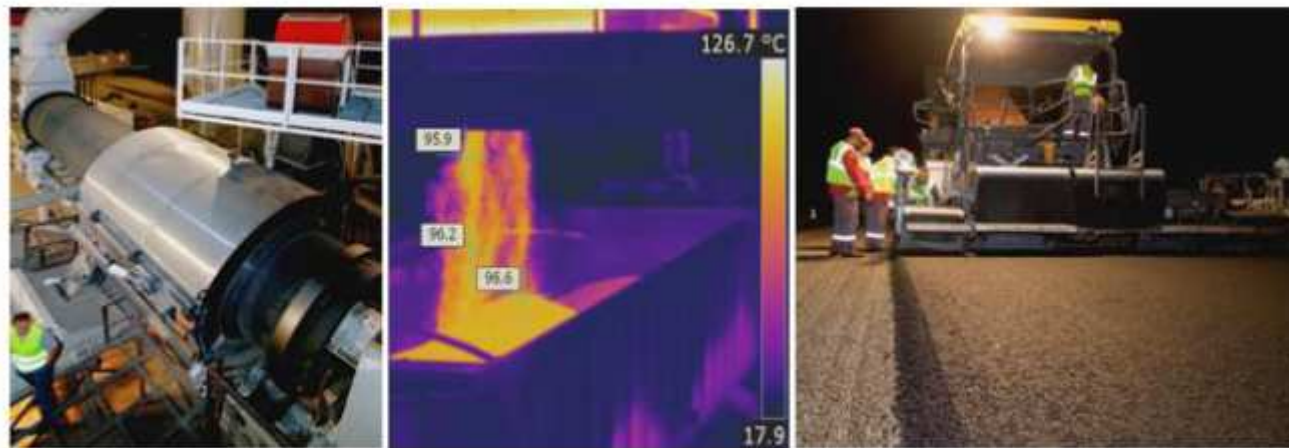


Figure 3: Example of a 4000-ton LEA[®] roadwork near Toulouse (France) with up to 50% RAP.

Energy and resources saving: applications

WARM MIXES ASPHALT: LABORATORY EVALUATION OF 2 MIX DESIGN METHODS

Paper N° 42 : **KLINCEVICIUS Mary**, BROSSEAUD Yves, DONY Anne, MAILLARD-NUNES Patricia, BERNUCCI Liedi, MOTTA Rosangela, DEL PRIORE Claudio, GAUDEFROY Vincent

- French – Brazillian partnership
- Marshall tests + SGC and stripping water resistance
- Environmental assessment of fumes generated in laboratory

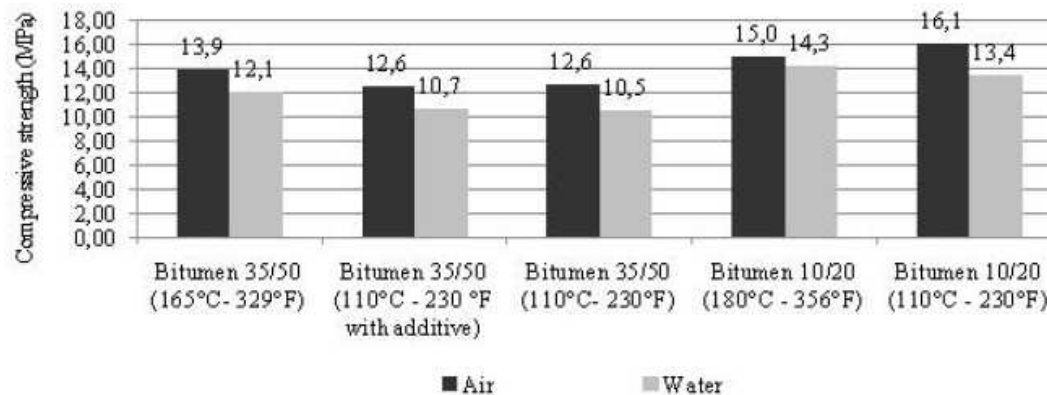


Figure 3. Duriez results (HMA, WMA with and without additive - 35/50 and 10/20 bitumens)

Cold in-place recycling for high performance roads

Paper N°565 : UGUET CANAL Nuria

- Less environmental impact using eco-emulsions
- About security covering the recycled mixture
- About execution working with 2 recycling teams in parallel
- About quality of compaction



Figure 2: Compaction of in-situ recycling with emulsion with the roller (Asphalt Manager). Hereby, densities are obtained of more than 2, 2 g/cm³

Energy and resources saving: applications

Warm waste asphalt recycling in Belgium – Overview of 30 years of experience

Paper N°93 : VAN DEN KERKHOFF Eric

- Some interesting statistics
- Recycling in different materials and in situ
- Production of RAP and quality issues

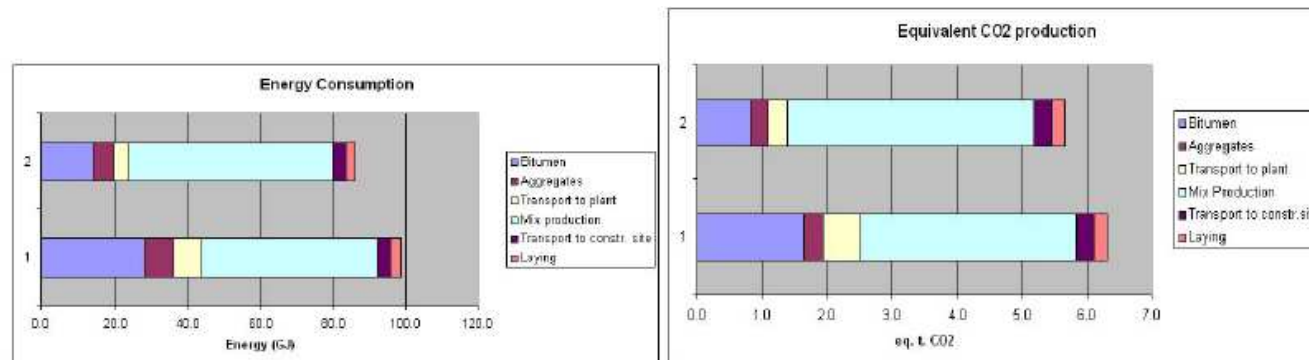


Chart 1&2 : energy consumption and equivalent CO₂ production for a bituminous base course layer of 6 cm thickness without RAP and with 50% of RAP.

(1 = Mix without RAP, 2 = with 50% of RAP)

Warm Mixes with RAP: case studies

Paper N° 282 : **CARBONNEAU Xavier** , **BRISSAUD Laurent**, **PELLEVOISIN Philippe**,
GALERA Vincent

- Description of the principle of WMA 3ELT
- Different case studies and worksites validation
- Technical and environmental data



Photo 1a: Laying the layer of WMA (hot bitumen + RAP) with 20% of RAP at La Ferté Macé



Photo 2b: Conveyor belt for RAP at the TBM 25 at the ACC work site at La Ferté Macé

Energy and resources saving: applications

Very high recycling rate (up to 70%) in HMA and WMA for sustainable road construction

Paper N°144 : OLARD françois , LE NOAN Claude, BONNEAU Dominique,
JOURDAN Marc, CHERFILS Richard

- Description of specific plants
- Preliminary lab characterisation
- Case study on motorway



Figure 2: Paving a high-modulus LMA² mixture (with 50% RAP aggregate and with a new 10/20 mm grade source) at 10°C on the French A28
Highway and Highway near Paris.

Energy and resources saving: applications

An innovative high-rate continuous recycling solution, applicable to HMA and WMA

Paper N°149 : **BONVALLET Jacques** , CAHOUR Jacky, TROUDET Paul

- High-rate recycling and rebuilding of the A28 motorway at conventional temperature (context, mix design, performance of the special equipment, results)
- High-rate recycling and rebuilding of the A28 motorway at warm temperature (context, mix design, performance of the special equipment, results) with a special formula of WMA



Figures 11 & 12 - Energy balance for recycling (energy consumption per structure - MJ/m³), energy balance for recycling - GHG emissions per structure in CO₂

Energy and resources saving: applications

Beluga, a mini hyper-mobile hot mix plant, produces asphalt with VEGECOL® binder

Paper N° 148 : BONVALLET Jacques, CAHOUR Jacky, TROUDET Paul

- Description of the machine
- Keys benefits
- Field of use for Végécol ® binder
- Environmental balance



Figure 1 - A compact mobile machine in a single unit



Figure 10 Application de gaz à effet de serre (CO₂) pour le renforcement d'un m² de chaussée.