Theme n°3 : Workshop 3.2

Energy and resources saving : applications

President: Ana Christina MARTINS (EP)

Moderator : Christine LEROY (EAPA)
Energy and resources saving: applications

• 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)
Energy and resources saving: applications

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

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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
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
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

![Graph showing compressive strength of various bitumen samples](image)

Figure 3. Duriez results (HMA, WMA with and without additive – 35/50 and 10/20 bitumens)
Energy and resources saving: applications

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

Paper N°93 : VAN DEN KERKHOOF 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)
Energy and resources saving: applications

Warm Mixes with RAP: case studies

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

- Description of the principle of WMA 3ELT
- Differents case studies and worksites validation
- Technical and environmental data
Energy and resources saving: applications

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

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

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

Figure 1: Paving a high-performance UTC mixture (with 95% RAP aggregates and with a read 120 mm granular shell) at 12°C on the French A28 high-speed highway near Genève.
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
Beluga, a mini hyper-mobile hot mix plant, produces asphalt with VEGECOL® binder


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