


AAPA 2012 Study tour visiting EAPA and Eurobitume

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AAPA

- Visit EAPA head quarters
- Binders specification harmonisation,
- Health and safety regulations around bitumen, REACH and purchasing models,
- Delivery of high performance pavement systems and products


XXV Technical Seminar of PAPA - 26 - 28 October 2011, Warsaw-Miedzeszyn , Poland 2



Overview Presentation

- European asphalt and bitumen standards
- Environmental items in these standards
- Work Zone Safety
- EAPA Environment Group
- Delivery of high performance pavement systems and products
- Purchasing models
- Health and safety regulations around bitumen and REACH and

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CEN TC227

Organization of the work of CEN/TC 227 "Road materials"

CEN/TC 227/CH'sP Secr: DE (Cohrs) Ch: U. Hahn		CEN/TC 227 "Road materials" Secr: DE (Cohrs) Ch: U. Hahn		ad hoc group "Airfields" Convener: J. Cook	
WG 1 Bituminous mixtures Secr: NL (E. Beuving) Conv: E. Beuving (BE)	WG 2 Surface dressing and slurry surfacing Secr: N.N. Conv: M. Heslop (UK)	WG 3 Materials for concrete roads incl. joint fillers and sealants Secr: ES (A. Aragón) Conv: C. Joffre (ES)	WG 4 Hydraulic bound and unbound mixtures Secr: DE (R. Cohrs) Conv: M. Schumacher (DE)	WG 5 Surface characteristics Secr: FR (Y. Cerezo) Conv: M. Boulet (FR)	WG 6 Dangerous substances Secr: DE (R. Cohrs) Conv:

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EU Asphalt Standards

CEN TC227 WG1

- TG 2 Test Methods
- TG3 Product Standards
- TG 4 Conformity Assessment Standards + RAP

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TG2 Test Methods

12697 series

- -1 Soluble Binder Content
- -2 Particle Size Distribution
- -3 Bitumen recovery
- -12 Water sensitivity of bituminous specimens
- -16 Resistance against studded tyres
- -22 Wheel tracking test
- -24 Resistance to fatigue
- -26 Stiffness
- -43 Resistance to fuel


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TG2 TEST METHODS

Several Test methods in 5-year review process
New standards (being developed)

- 45 : Saturation Ageing Tensile Stiffness (SATS) Conditioning Test
- 46 : Low temperature cracking and properties
- 47 : Determination of the ash content of natural asphalts
- 48 : Bond strength
- 49 : Friction After Polishing
- 50 "Scuffing resistance" the ARTe test method was chosen based on blind testing, but ...




TG 3 PRODUCT STANDARDS

Product standards in 5-year Review Process


Bituminous mixtures - Material specifications

- 13108- Part 1: Asphalt concrete
- 13108- Part 2: Asphalt concrete for very thin layers
- 13108- Part 3: Soft asphalt
- 13108- Part 4: Hot rolled asphalt
- 13108- Part 5: Stone mastic asphalt
- 13108- Part 6: Mastic asphalt
- 13108- Part 7: Porous asphalt
- 13108- Part 8: Recycled asphalt
- 13108- Part 9: Asphalt for Ultra Thin Layers



TG 3 PRODUCT STANDARDS

In April 2011 it was decided to work only on the 'normal approach' for the next generation of product standards, where the options for the two approaches ('open' and 'prescriptive') are available within one standard, such that individual countries can choose which criteria they wish to adopt




TG 3 PRODUCT STANDARDS

So for Asphalt Concrete

- the 'prescriptive' (Empirical-approach) and
- the 'open' (Performance-approach) will be merged.

For Porous Asphalt and SMA some "performance requirements" will be added to the existing standard.


A line (in careful wording) will be added to avoid over specification.



TG 4 CONFORMITY ASSESSMENT STANDARDS

EN 13108-8 RAP
 EN 13108-20 Type Testing
 EN 13108-21 FPC

- In 5 Year Review Process




CHALLENGES

- A condition procedure to age asphalt samples
- Specifications for cold mixtures:
 - emulsion mixtures
 - foam mixtures
- Conditioning procedures for (Foamed) Warm Mixes
- Test methods for Warm and half Warm Mixes

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WORK ZONE SAFETY - SUMMARY



EU Bitumen Standards

- CEN TC336
- CEN TC336 WG1

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CEN TC336

Bituminous binders

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    graph TD
      A[Bituminous binders] --> B[Paving grade bitumen  
EN 12591]
      A --> C[Special paving grade bitumen  
Hard paving grade EN 13924-1  
Multigrade EN 13924-2]
      A --> D[Polymer modified bituminous binders  
EN 14023]
      A --> E[Cationic bituminous emulsions  
EN 13808]
      A --> F[Cut-back & fluxed bituminous binders  
EN 15322]
      A --> G[Oxidized bituminous (industrial applications)  
EN 13304]
      A --> H[Hard grade industrial bituminous (industrial applications)  
EN 13305]
          
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Bitumen Standards

- EN 12591 “Specifications for paving grade bitumen”
- EN 13924 “Specifications for hard paving grade bitumens”
- EN13924-2 “Multi-grades”
- EN 14023 “Specifications for PMB”
- EN 13808 “Framework for specifying cationic bituminous emulsions”
- EN 15322 “Framework for specifying cut-back and fluxed bituminous binders”
- EN 13808 “Bituminous Emulsions”

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Paving Grade

Table 1A – Paving grade bitumen specifications for grades from 20 x 0,1 mm to 220 x 0,1 mm penetration – Properties applying to all paving grade bitumen listed in this table

Property	Test method	Unit	20/30	30/45	35/50	40/60	50/70	70/100	100/150	180/220
Penetration at 25 °C	EN 1426	0,1 mm	20 – 30	30 – 45	35 – 50	40 – 60	50 – 70	70 – 100	100 – 150	180 – 220
Softening point	EN 1427	°C	55 – 63	62 – 69	50 – 58	48 – 58	46 – 54	43 – 51	39 – 47	35 – 43
Resistance to hardening at 163 °C	En 12603-1									
Retained penetration		%	± 55	± 53	± 53	± 50	± 50	± 46	± 43	± 37
Increase in softening point, - Severity 1		°C	± 8	± 8	± 8	± 9	± 9	± 10	± 10	± 11
or			or	or	or	or	or	or	or	or
Increase in softening point, - Severity 2*		°C	± 10	± 11	± 11	± 11	± 11	± 11	± 12	± 12
Change of mass [†] (absolute value)		%	± 0,5	± 0,5	± 0,5	± 0,5	± 0,5	± 0,8	± 0,8	± 1,0
Flash point	EN ISO 2592	°C	≥ 240	≥ 240	≥ 240	≥ 230	≥ 230	≥ 230	≥ 230	≥ 220
Solubility	EN 12582	%	≥ 99,0	≥ 99,0	≥ 99,0	≥ 99,0	≥ 99,0	≥ 99,0	≥ 99,0	≥ 99,0

* When Severity 2 is selected, it shall be associated with the requirement for Fraass breaking point and/or penetration index measured on the unaged binder (see Table 1B).
† Change in mass can be either positive or negative.

Properties in Table 1A shall be specified for all paving grade bitumens listed in this table. They are associated with regulatory or HSE requirements and shall be included in specifications.

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Table 2A – Paving grade bitumen specifications for grades from 250 x 0,1 mm to 900 x 0,1 mm penetration - Properties applying to all paving grade bitumen listed in this table

Property	Test method	Unit	250/330	330/430	500/650	650/900
Penetration at 25 °C	EN 1426	0,1 mm	250 – 330	–	–	–
Penetration at 15 °C	EN 1426	0,1 mm	70 – 130	90 – 170	140 – 260	180 – 360
Dynamic viscosity at 60 °C	EN 12596	Pa.s	≥ 18	≥ 12	≥ 7,0	≥ 4,5
Softening point	EN 1427	°C	30 – 38	–	–	–
Resistance to hardening at 163 °C	EN 12607-1					
Viscosity ratio at 60 °C			± 4,0	± 4,0	± 4,0	± 4,0
or						
Increase in softening point		°C	± 11	–	–	–
Change of mass [†] (absolute value)		%	± 1,0	± 1,0	± 1,5	± 1,5
Flash point	EN ISO 2719	°C	≥ 180	≥ 180	≥ 180	≥ 180
Solubility	EN 12582	%	≥ 99,0	≥ 99,0	≥ 99,0	≥ 99,0

† Change in mass can be either positive or negative.

Properties in Table 2A shall be specified for all paving grade bitumens listed in this table. They are associated with regulatory or HSE requirements and shall be included in specifications.

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Table 2B – Paving grade bitumen specifications for grades from 250 x 0,1 mm to 900 x 0,1 mm penetration - Properties associated with regulatory or other regional requirements

Property	Test method	Unit	250/330	330/430	500/650	650/900
Fraass breaking point	EN 12593	°C	5 – 18 or NR [†]	5 – 18 or NR [†]	5 – 20 or NR [†]	5 – 20 or NR [†]
Kinematic viscosity at 135 °C	EN 12595	mm ² /s	≥ 100 or NR [†]	≥ 85 or NR [†]	≥ 65 or NR [†]	≥ 50 or NR [†]

† NR: No Requirement may be used when there are no regulations or other regional requirements for the property in the territory of intended use.

Properties in Table 2B are required to meet specific regional conditions. They are associated with regulatory or other regional requirements.

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PMB-1

Table 1A — Framework specifications for polymer modified bitumens – Properties applying to all polymer modified bitumens

PROPERTY	TEST METHOD	UNIT	Classes for all polymer modified bitumens										
			2	3	4	5	6	7	8	9	10	11	
Penetration at 25 °C	EN 1426	0,1 mm	10-40	25-55	45-80	40-100	65-100	75-150	90-150	120-200	200-300		
Softening Point	EN 1427	°C	≥ 80	≥ 75	≥ 70	≥ 65	≥ 60	≥ 55	≥ 50	≥ 45	≥ 40		
Cohesion*	Force ductility* (50 minimal traction) EN 13309 followed by EN 13703	J/m ²	≥ 3	≥ 2	≥ 1	≥ 2	≥ 2	≥ 3	≥ 3,5	≥ 2	≥ 0,5	≥ 0,5	
	Tensile test* (100 minimal traction) EN 13307 followed by EN 13703	J/m ²	≥ 3	≥ 2	≥ 1	≥ 3	≥ 3						
	Yield penetration* (shear test) EN 13368	J/m ²	≥ 0,7										
Resistance to hardening	Retained Penetration	%	≥ 35	≥ 40	≥ 45	≥ 50	≥ 55	≥ 60					
	Increase in softening point	°C	≤ 8	≤ 10	≤ 12								
Flash Point	Change of mass*	%	± 0,3	± 0,5	± 0,8	± 1,0							
	EN ISO 2592	°C	≥ 250	≥ 235	≥ 220								

* One cohesion method shall be chosen based on end application. Yield cohesion (EN 13368) shall only be used for surface dressing binders.
 † The test is at the RTOT at 103°C. For some highly viscous polymer modified bitumens where the viscosity is too high to provide a moving film it is not possible to carry out the RTOT at the reference temperature of 103°C. In such cases the procedure shall be carried out at 100°C in accordance with EN 12927-1.
 ‡ Change of mass can be positive or negative.

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PMB-2


Table 1B — Framework specifications for polymer modified bitumens – Properties associated with regulatory or other regional requirements

PROPERTY	TEST METHOD	UNIT	Classes for regional requirements										
			0	1	2	3	4	5	6	7	8	9	10
Fracture Breaking Point	EN 12593	°C	NR ^a	TBR ^b	≤ 8	≤ 5	≤ 7	≤ 10	≤ 12	≤ 15	≤ 18	≤ 20	≤ 22
Elastic recovery	25 °C	%	NR ^a	TBR ^b	≥ 80	≥ 70	≥ 60	≥ 50					
	10 °C	%	NR ^a	TBR ^b	≥ 75	≥ 50							

^a NR: No Requirement may be used when there are no regulations or other regional requirements for the property in the territory of intended use.
^b TBR: To Be Reported may be used when there are no regulations or other regional requirements for the property in the territory of intended use, but the property has been found useful to describe polymer modified bitumens.

The properties in Table 1B are required to meet specific regional conditions. They are associated with regulatory or other regional requirements.

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Multi grade - draft


Table 1C — Framework specifications for polymer modified bitumens – Additional properties

PROPERTY	TEST METHOD	UNIT	Classes for the additional properties of polymer modified bitumens								
			0	1	2	3	4	5	6	7	
Plasticity range	Sub-clause 5.2.8.4	°C	NR ^a	TBR	≥ 85	≥ 80	≥ 75	≥ 70	≥ 65	≥ 60	
Drop in softening point after EN 12607-1	EN 1427	°C	NR ^a	TBR	≥ 2	≤ 5					
Elastic recovery at 25 °C after EN 12607-1	EN 13308	%	NR ^a	TBR	≥ 70	≥ 60	≥ 50				
Elastic recovery at 10 °C after EN 12607-1	EN 13369	%	NR ^a	TBR	≥ 50						
Storage stability ^b	EN 13369										
Difference in softening point	EN 1427	°C	NR ^a	TBR ^b	≤ 6						
Storage stability ^c	EN 13369										
Difference in penetration	EN 1426	0,1 mm	NR ^a	TBR ^b	≤ 9	≤ 13	≤ 19	≤ 25			

^a NR: No Requirement may be used when there are no requirements for the property in the territory of intended use.
^b Storage conditions of the polymer modified binder shall be given by the supplier. Homogeneity is necessary for polymer modified bitumens. The consistency of polymer modified bitumens to separate during storage may be assessed by the storage stability test (see EN 13369). If the product does not fulfil the properties in Table 1C classes 2 to 5, information shall be given by the supplier regarding storage conditions for the polymer modified bitumen to avoid separation of the components and to ensure the homogeneity of the product.
 NOTE: The following data may be given by the supplier of the polymer modified bitumen in its product data sheet:
 — solvent dispersion (see EN 13012 (2))
 — solubility (see EN 12592 (2)) using the appropriate solvent declared by the supplier;
 — handling temperature;
 — minimum storage and pumping temperature;
 — maximum and minimum mixing temperature, for comparison purposes, EN 13702-1 or EN 13702-2 should be used;
 — density (see EN 15525).

The properties in Table 1C are additional properties, which are non-mandatory, but have been found useful in some countries to describe polymer modified bitumens.

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Multi Grades (positive PI)

Table 2 — Specifications for multigrade paving grade bitumens: properties associated with regulatory or other regional requirements

Property	Test method	Unit	Class						
			0	1	2	3	4	5	
Fracture breaking point	EN 12593	°C	NR ^a	TBR ^b	≤ 8	≤ 12	≤ 15	≤ 17	
Dynamic viscosity at 60 °C	EN 12596	Pa · s	NR ^a	TBR ^b	≥ 300	≥ 600	≥ 900	≥ 1 500	
Kinematic viscosity at 135 °C	EN 12595	mm ² /s	NR ^a	TBR ^b	≥ 200	≥ 300	≥ 700	≥ 1 200	

^a NR: No Requirement may be used when there are no regulations or other regional requirements for the property in the territory of intended use.
^b TBR: To Be Reported may be used when there are no regulations or other regional requirements for the property in the territory of intended use, but the property has been found useful to describe multigrade bitumens.


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Problems / challenges

- Adhesion
- Constancy / consistency of quality (ITT)
- Long Term Ageing


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CEN TC336 WG1 TG5

- PRS for complex binders


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PROGRESS

- PRS process will be without “field validation”
- “Move forward and fill the current gaps”
- Simple binders described by EN 12591, and complex binders by future PRS
- CEN Data Collection to be incorporated
- The new PRS: a separate standard or something linked to each current bitumen standard ?


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TG's

- Which test for which property?
 - TG1 – High Service Temperatures
 - TG2 – Low Service Temperatures
 - TG3 – Ageing-conditioning


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TG1 HIGH SERVICE TEMP

Rutting - Method	Suggestion	Comments
DSR G ² /sin(delta)	Yes/no	for addressing only linear zone
DSR MSCR test		Relevant for addressing also non linear zone
DSR LSV-EVT1		Not suitable for high mod PMBs
DSR ZSV at 60°C creep mode		Not suitable for high mod PMBs
stiffness at service temp	Suggestion	Comments
DSR Complex mod		To clarify temp & freq


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TG2 LOW SERVICE TEMP / CRACKING

Method	Suggestion	Comments (3 different properties)
BBR	Yes/no	Not the most suitable for continuous network PMBs (stiffness at low temp)
Fracture Tough.		In due course for EN (crack propagation)
Fraass		Not the suitable for continuous network PMBs (crack formation)


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TG3 AGEING-CONDITIONING

Method	Suggestion for reference method	Comments
RTFOT	Yes	Short term
PAV	yes	Long term
RCAT	?	Short/long/both
Modified RTFOT	?	short


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OTHER REQUIREMENTS

Property	Method	Suggestion	Comments
Mixing-handling	Viscosity EN 12595	Yes/no	available
Storage stability	EN 13399		available
Safety	EN ISO 2592 Cleveland		available
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PRS FORMAT


Option 1	Option 2	
EN12591	EN12591	Yes
EN 13924-1	EN 13924-1 including empirical and PRS	Avoid overspecification
EN 13924-2	EN 13924-2 including empirical and PRS	
EN 14023	EN 14023 including empirical and PRS	
New Standard		

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- 
- ## Challenges
- Takes a lot of time
 - Moving forward (very slowly)
 - Good test methods are needed
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- ## Environmental issues
- CEN TC351**
- Release of dangerous substances to air and groundwater
- CEN TC350 Sustainability of construction works**
- Environmental product declarations - Core rules for the product category of construction products: **EN 15804**
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- ## Work Zone Safety
- ERF and CEN TC226
 - CEDR
 - EAPA
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WORK ZONE SAFETY


ERF Working Group

OBJECTIVES

Raise the safety level for road workers and road users dealing with work zones on public roads by contributing to European guidelines for use of road equipment in work zones

ERF WORK ZONE SAFETY - SUMMARY ERF 2012-05-16 36

 **ERF WZS**


ERF WZS Working Group 

WORK ITEMS

- produce an overview and synthesis of national guidelines, legislations and practices in selected European countries
- detect and transfer good practices
- identify improvements adapted to the state of the art
- propose uniform approach throughout Europe

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WORK ZONE SAFETY - SUMMARY ERF 2012-05-16

 **ERF WZS - CEN TC226**

DELIVERABLES


- format of a TR – Technical report
 - “Technical info not included in a standard”


CEN TC226 Resolution:

Group with o.a. ERF to prepare for the next plenary meeting in June 2013, a proposal on a draft guide(s) for safe work zones for the products covered by CEN/TC 226.

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WORK ZONE SAFETY - SUMMARY ERF 2012-05-16

 **CEDR**

 **Description of Research Needs (DoRN)**
May 2012

Conférence Européenne des Directeurs des Routes
Conference of European Directors of Roads


CEDR TRANSNATIONAL ROAD RESEARCH PROGRAMME
Call 2012

Safety:

- Safety of road workers and interaction with road users
- Use of vehicle restraint systems

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 **EAPA**

The task of the EAPA Task Group is to:

- provide member states with good examples of raising awareness of the safety of the road workers
- create a document that can be used by the EAPA members to start their own campaign at company level or at national level
- create a document that can be used as a lobbying tool for EAPA at European level.
- collect data to show how big the problem is (data of fatalities caused by general public).

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 **Examples**





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 **DATA**


- In the Netherlands about 2% of the total number of people killed in traffic accidents are in Work Zones.
- In the USA it is also around 2% (2010: 1,75%; 2009: 2,00% and 2008: 1,91%)
- In Europe 50.000 people killed in accidents would result in an estimate of : 1.000 per year.
- In Europe-27 countries in 2009: 34.550.
- 2% would be: about 700 in Work Zones.

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EAPA Environment Group

Work plan 2012-2014

Sustainability

- Warm Mix Asphalt Stimulating use of WMA
- Recycling EAPA TC is leading
- Carbon Footprint
- Energy Reduction Following the EU developments
- Rolling Resistance
- EU ETS
- Waste Framework Directive with EPRA
- Green Public Procurement (not a main priority)

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EPD

- Example of Environmental Product Declaration as developed in Norway was presented and explained
- Each asphalt producer can produce its own EPD and he can show the environmental advantages of his product.
- In the future this EPD will play a role in tendering, but not yet (in Norway).
- The EPD produced in Norway is following the European Standard (EN 15804 of CEN TC350).
- EAPA will translate Norwegian EPD as an example / template

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CO₂ CALCULATORS - LCI

- Update asPECT (UK - for free). Adding maintenance
- Update SEVE (Système d'Evaluation des Variantes Environnementales) (France – not free / fee). v2.0
- Need revision of the LCI of 2000 discussed
- Germany UK France have national data, so for them there is no update needed.
- No LCI updated need but: Guidance document “Carbon Footprint Calculators”
 - How to calculate - input data - use – tips and tricks
- Goal to have it ready in 2013.

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EU-ETS

- EU Emission Trade System
- ≥ 35 MW: in EU-ETS
- $> 20 - < 35$ depends on member state
- update regarding EU-ETS by Simon van der Byl
- In the UK it is often a plant by plant decision.
- Some mentioned that it might be good to be in the exemption group. It was also mentioned that the quota trade is complex and more like a nightmare
- It is impossible to say what is the right decision.

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WMA

- Roar Telle explained the Warm Mix Asphalt studies they did on 11 test sections in Norway in 2011
- USIRF WMA Recommendation



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Climate Change

- Adapting road system to climate change is primary task of the road owners.
- Good drainage, sewerage systems and ditches along the road are important to keep the road structure dry.
- Norway is using adhesion promoters in every project
- The EAPA members are ready.
- We have the techniques and knowledge to adapt to the climate change consequences.

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WASTE FRAMEWORK DIRECTIVE

- Update
- European Platform for Recycled Aggregates – EPRA
- Mostly regulated at national level
- We keep it in the agenda

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CEN TC351


- Update TC 154 TG13 / CEN TC227 WG6
- Release of Regulated Dangerous Substances (CEN TC 351)
- We get Mandate: \pm 2015
- EPD (CEN TC350): \pm 2018

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 **ROLLING RESISTANCE**

- At a certain moment a response is needed regarding this document
- EAPA needs a plan and a budget
- Next meeting




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 **OTHERS**

- Delivery of high performance pavement systems and products
- Purchasing models

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 **PHILIPPE DEWEZ**

- Health and safety regulations around bitumen
- REACH

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