European Committee for Standardization
Comité Européen de Normalisation
Europäisches Komitee für Normung

« Bituminous binders »	CEN/TC 336
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Circulation of the first pre-draft of Annex I & II of the Standardisation Request project

COMMENTARIES/ DECISIONS	Task-Group "*Standardisation Request* " drafted the first pre-draft of Annex I & II of the Standardisation Request project. This document comprises the hEN work program and lists, for each hEN revision project, the foreseen essential characteristics (sorted by CPR basic work requirements) mentioning whether there will be a Class or a Threshold. This document also lists, separately, additional non-harmonized installation characteristics. This document will be discussed by both working groups at their respective coming meetings (**2019-09-17&18** for WG 1, **2019-11-14&15** for WG 2). Should this document be amended, the updated version will be re-circulated to TC 336 ahead of next plenary meeting.
FOLLOW UP	Please prepare **from now** to review and comment on this **key** document for the next TC 336 plenary meeting on **2019-11-12&13**. After review at plenary meeting, this document will be submitted to TC 336's approval by correspondence (early 2020) via a CIB, before being submitted to EC.
SOURCE	CEN/TC 336 Secretariat

ANNEX I

List of new European standards to be drafted, list of existing standards to be revised and list of draft standards to be completed as referred to in Article 1

Table 1: List of new candidate harmonized European standards and deadlines for their adoption

Reference information		Deadline for the adoption[1] by the ESOs
1	**EN 13924-1** Bitumen and bituminous binders – Specification framework for special paving grade bitumen – Part 1: Hard paving grade bitumens	Already adopted by ESO (DAV : 2015/12/02)
2	**EN 13924-2** Bitumen and bituminous binders – Specification framework for special paving grade bitumen – Part 2: Multigrade paving grade bitumens	Already adopted by ESO (DAV : 2014/03/26)

EN 13924-1 will supersede EN 13924 once cited.

[1] 'Adoption' refers to the relevant European standardisation organisation making an adopted standard available to its members or the public.

Table 2: List of existing harmonized standards to be revised and deadlines for their adoption

	Reference information	Deadline for the adoption[2] by the ESOs
1	**EN 12591:2009** Bitumen and bituminous binders - Specifications for paving grade bitumens	5 years after approval of this Standardisation Request
2	**EN 13808:2013** Bitumen and bituminous binders - Framework for specifying cationic bituminous emulsions	5 years after approval of this Standardisation Request
3	**EN 13924:2006** Bitumen and bituminous binders - Specifications for hard paving grade bitumens **EN 13924:2006/AC:2006**	See Table 1
4	**EN 14023:2010** Bitumen and bituminous binders - Specification framework for polymer modified bitumens	DAV 2021/07/22
5	**EN 15322:2013** Bitumen and bituminous binders – Framework for specifying cut□back and fluxed bituminous binders	5 years after approval of this Standardisation Request

[2] 'Adoption' refers to the relevant European standardisation organisation making an adopted standard available to its members or the public.

Table 3: List of draft standards to be completed and deadlines for their adoption

	Reference information	Deadline for the adoption[3] by the ESOs
1	NO EXPECTED DRAFT STANDARDS	
2		

[3] 'Adoption' refers to the relevant European standardisation organisation making an adopted standard available to its members or the public.

ANNEX II

Requirements for the standards referred to in Article 1

Part A. General requirements for standards listed in Annex I

1. Legal structures to be supported by the harmonised standards

The harmonised standards shall support the establishment of a harmonised system as set out in Regulation (EU) No 305/2011.

The harmonised standards shall provide the methods and the criteria for assessing the performance of construction products in relation to their essential characteristics. Those essential characteristics relate to the basic requirements for construction works (BWR), which therefore shall be taken into account from the beginning and throughout the standardisation process.

2. Product scope

Bituminous binder products covered by this Standardisation Request are:

- Paving grade bitumens
- Cationic bituminous emulsions
- Hard paving grade bitumens
- Multigrade paving grade bitumens
- Polymer modified bitumens
- Cut-back and fluxed bituminous binders

3. Potential uses in construction elements

Bituminous binder products are intended to be used for the construction and maintenance of roads, airfields and other paved areas:

- in combination with different mineral aggregate fractions for the production of bituminous mixtures (coating applications with either hot bituminous binders or bituminous emulsions).
- for spraying applications in combination with mineral aggregates (surface dressing and similar)
- for spraying applications on existing pavement surface (impregnation, tack-coat and similar)

4. Applicable system(s) of assessment and verification of constancy of performance

For bituminous products covered by EC Decision 98/601/EC[1] as amended by EC Decision 2001/596[1] taking into account the essential characteristics and the intended uses of the products, the applicable systems for assessment and verification of constancy of performance (AVCP) are determined, depending on their subfamilies, as follows:

Product(s)	Intended use(s)	Level(s) or class(es) (Resistance to fire)	AVCP system
Bituminous mixtures Surface treatments	For uses subject to reaction to fire regulations	**A1**[(2)], **A2**[(2)], **B**[(2)], **C**[(2)] **A1**[(3)], **A2**[(3)], **B**[(3)], **C**[(3)], **D**, **E** (**A1** to **E**), **F**	**1** **3** **4**
Bitumen	**For road construction and surface treatment of roads**		**2+**
Bituminous mixtures	For road construction and surface treatment of roads	--	**2+**
Surface treatments	For surface treatment of roads	--	**2+**
Bridge deck waterproofing products and kits	For bridge decks	--	**2+**
Ancillary products	For concrete roads	--	**4**

2 - Products/materials for which a clearly identifiable stage in the production process results in any improvement of the reaction to fire classification (e.g. an addition of fire retardants or a limiting of organic material)

3 - Products/materials not covered by footnote

1 - OJEU L 287 of 24.10.1998) as amended by EC Decision 2001/596/EC (OJEU L 209 of 2.8.2001)

Part B. Specific requirements for new candidate harmonized European standards listed in Table 1 of Annex I

1. Requirements for all standards

Standards shall reflect the state of the art.

The harmonised standards shall refer to intended uses of products to be covered by them, as foreseen in part B.2 below.

CEN is authorised to establish in the harmonised standards classes and threshold levels for performance in relation to the essential characteristics of those products.

The applicable rules for factory production control (FPC) and the technical details necessary for the implementation of the system of assessment and verification of constancy of performance (AVCP) shall also be specified in the harmonised standards.

For BWR 7, Sustainable use of natural resources, the harmonised standards shall identify and enumerate all the relevant elements of performance related to the whole life cycle of the products concerned. This standardisation work shall be based on EN 15804.

The harmonised standards shall also prescribe that, when a manufacturer wants to declare the performance of his product in relation to the essential characteristic Environmental sustainability, he shall present in the declaration of performance the results of the assessment of all those elements of performance specified in the harmonised standard in question and he shall include in the calculation all the mandatory modules according to EN 15804.

2. Requirements for specific standards

CEN shall draft new harmonised standards, containing the essential characteristics listed below:

2.1. EN 13924-1 for Hard paving grade bitumens

2.1.1. BWR 1: Mechanical resistance and stability

Essential characteristics (including proxies, if any)	**Class Threshold**	**AVCP system**
Consistency at intermediate service temperature	**C**	**2+**
Consistency at low service temperature	**T**	**2+**
Consistency at elevated service temperature	**C**	**2+**
Viscoelastic behaviour		**2+**
Temperature dependence of consistency at intermediate service temperature	**T**	**2+**
Temperature dependence of consistency elevated service temperature	**T**	**2+**
Durability of consistency at intermediate service temperature	**T**	**2+**
Durability of consistency at elevated service temperature	**T**	**2+**

2.1.2. BWR 2: Safety in case of fire

No standardization needs identified

2.1.3. BWR 3: Hygiene, health and the environment

No standardisation needs identified

2.1.4. BWR 4: Safety and accessibility in use

No standardisation needs identified

2.1.5. BWR 5: Protection against noise

No standardization needs identified

2.1.6. BWR 6: Energy economy and heat retention

No standardization needs identified

2.1.7. BWR 7: Sustainable use of natural resources

Essential characteristics (including proxies, if any)	**Class Threshold**	**AVCP system**
<u>Environmental sustainability</u> **<u>Parameters describing environmental impacts</u>:** - Acidification of soil and water potential (AP) - Ozone depletion potential (ODP) - Global warming potential (GWP) - Eutrophication potential (EP) - Photochemical ozone creation potential (POCP) - Depletion of abiotic resources (elements) - Depletion of abiotic resources (fossil fuels) **<u>Parameters describing resource use</u>:** - Use of renewable primary energy excluding renewable primary energy resources used as raw materials - Use of renewable primary energy resources used as raw materials - Total use of renewable primary energy resources (primary energy and primary energy resources used as raw materials) - Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials - Use of non-renewable primary energy resources used as raw materials - Total use of non-renewable primary energy resources (primary energy and primary energy resources used as raw materials) - Use of secondary material - Use of renewable secondary fuels - Use of non-renewable secondary fuels - Use of net fresh water **<u>Other environmental information describing waste categories</u>:** - Hazardous waste disposed - Non-hazardous waste disposed - Radioactive waste disposed **<u>Other environmental information describing output flows</u>:** - Components for re-use - Materials for recycling - Materials for energy recovery		

2.2 EN 13924-2 for Multigrade paving grade bitumens

2.2.1. BWR 1: Mechanical resistance and stability

Essential characteristics (including proxies, if any)	**Class Threshold**	**AVCP system**
Consistency at intermediate service temperature	**C**	**2+**
Consistency at low service temperature	**T**	**2+**
Consistency at elevated service temperature	**C**	**2+**
Viscoelastic behaviour		**2+**
Temperature dependence of consistency at intermediate service temperature	**C**	**2+**
Temperature dependence of consistency elevated service temperature	**T**	**2+**
Durability of consistency at intermediate service temperature	**T**	**2+**
Durability of consistency at elevated service temperature	**T**	**2+**

2.2.2. BWR 2: Safety in case of fire

No standardization needs identified

2.2.3. BWR 3: Hygiene, health and the environment

No standardisation needs identified

2.2.4. BWR 4: Safety and accessibility in use

No standardization needs identified

2.2.5. BWR 5: Protection against noise

No standardization needs identified

2.2.6. BWR 6: Energy economy and heat retention

No standardization needs identified

2.2.7. BWR 7: Sustainable use of natural resources

Essential characteristics (including proxies, if any)	**Class Threshold**	**AVCP system**
<u>Environmental sustainability</u> **<u>Parameters describing environmental impacts</u>:** - Acidification of soil and water potential (AP) - Ozone depletion potential (ODP) - Global warming potential (GWP) - Eutrophication potential (EP) - Photochemical ozone creation potential (POCP) - Depletion of abiotic resources (elements) - Depletion of abiotic resources (fossil fuels) **<u>Parameters describing resource use</u>:** - Use of renewable primary energy excluding renewable primary energy resources used as raw materials - Use of renewable primary energy resources used as raw materials - Total use of renewable primary energy resources (primary energy and primary energy resources used as raw materials) - Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials - Use of non-renewable primary energy resources used as raw materials - Total use of non-renewable primary energy resources (primary energy and primary energy resources used as raw materials) - Use of secondary material - Use of renewable secondary fuels - Use of non-renewable secondary fuels - Use of net fresh water **<u>Other environmental information describing waste categories</u>:** - Hazardous waste disposed - Non-hazardous waste disposed - Radioactive waste disposed **<u>Other environmental information describing output flows</u>:** - Components for re-use - Materials for recycling - Materials for energy recovery		

Part C. Specific requirements for revision of existing standards listed in Table 2 of Annex I

1. Requirements for all standards

Standards shall reflect the state of the art.

The harmonised standards shall refer to intended uses of products to be covered by them, as foreseen in part B.2 below.

CEN is authorised to establish in the harmonised standards classes and threshold levels for performance in relation to the essential characteristics of those products.

The applicable rules for factory production control (FPC) and the technical details necessary for the implementation of the system of assessment and verification of constancy of performance (AVCP) shall also be specified in the harmonised standards.

For BWR 7, Sustainable use of natural resources, the harmonised standards shall identify and enumerate all the relevant elements of performance related to the whole life cycle of the products concerned. This standardisation work shall be based on EN 15804.

The harmonised standards shall also prescribe that, when a manufacturer wants to declare the performance of his product in relation to the essential characteristic Environmental sustainability, he shall present in the declaration of performance the results of the assessment of all those elements of performance specified in the harmonised standard in question and he shall include in the calculation all the mandatory modules according to EN 15804.

2. Requirements for specific standards

CEN shall draft new harmonised standards, containing the essential characteristics listed below:

2.1. EN 12591 for paving grade bitumens

2.1.1. BWR 1: Mechanical resistance and stability

Essential characteristics (including proxies, if any)	**Class Threshold**	**AVCP system**
Consistency at intermediate service temperature	**C**	**2+**
Consistency at low service temperature	**T** **	**2+**
Consistency at elevated service temperature	**C** * & **	**2+**
Temperature dependence of consistency at intermediate service temperature	**C**	**2+**
Temperature dependence of consistency elevated service temperature	**T and C**	**2+**
Durability of consistency at intermediate service temperature	**T**	**2+**
Durability of consistency at elevated service temperature	**T**	**2+**
Durability of consistency at low service temperature		**2+**
Temperature sensitivity		**2+**

*** for this characteristic the class(es) in the cited version will be modified**

**** for this characteristic a class will be created versus cited version**

2.1.2. BWR 2: Safety in case of fire

No standardization needs identified

2.1.3. BWR 3: Hygiene, health and the environment

No standardisation needs identified

2.1.4. BWR 4: Safety and accessibility in use

No standardisation needs identified

2.1.5. BWR 5: Protection against noise

No standardization needs identified

2.1.6. BWR 6: Energy economy and heat retention

No standardization needs identified

2.1.7. BWR 7: Sustainable use of natural resources

Essential characteristics (including proxies, if any)	**Class Threshold**	**AVCP system**
<u>Environmental sustainability</u> **<u>Parameters describing environmental impacts</u>:** - Acidification of soil and water potential (AP) - Ozone depletion potential (ODP) - Global warming potential (GWP) - Eutrophication potential (EP) - Photochemical ozone creation potential (POCP) - Depletion of abiotic resources (elements) - Depletion of abiotic resources (fossil fuels) **<u>Parameters describing resource use</u>:** - Use of renewable primary energy excluding renewable primary energy resources used as raw materials - Use of renewable primary energy resources used as raw materials - Total use of renewable primary energy resources (primary energy and primary energy resources used as raw materials) - Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials - Use of non-renewable primary energy resources used as raw materials - Total use of non-renewable primary energy resources (primary energy and primary energy resources used as raw materials) - Use of secondary material - Use of renewable secondary fuels - Use of non-renewable secondary fuels - Use of net fresh water **<u>Other environmental information describing waste categories</u>:** - Hazardous waste disposed - Non-hazardous waste disposed - Radioactive waste disposed **<u>Other environmental information describing output flows</u>:** - Components for re-use - Materials for recycling - Materials for energy recovery		

2.2. EN 13808:2013 for cationic bituminous emulsions

2.2.1. BWR 1: Mechanical resistance and stability

Essential characteristics (including proxies, if any)	**Class Threshold**	**AVCP system**
Essential characteristics applicable to the emulsion as such		
Breaking behaviour in the presence of mineral surfaces (only for emulsions sprayed in combination with aggregates and for surface dressings and similar intended use).	**C and T**	**2+**
Penetration behaviour for impregnation emulsions.		**2+**
Comment: for other emulsion applications, there is either no appropriate performance test available (e.g. tack coat emulsions) or performance needs to be assessed in the frame of the performance evaluation of the final product (coating emulsions).		
Water effect on binder adhesion for emulsions sprayed in combination with aggregates. Adhesivity by water immersion test performed on an aggregate which has been coated with the bituminous emulsion and left to cure after the breaking of the emulsion.	**T**	**2+**
Comment: for other emulsion applications, this aspect of performance is either not relevant (e.g. tack coat emulsions) or performance needs to be assessed in the frame of the performance evaluation of the final product (coating emulsions).		
Essential characteristics applicable to a recovered binder		
The recovered binder is the binder obtained after the breaking of the emulsion and the separation from the water. It conditions the mechanical behaviour of the final paving product in its initial stage.		
Consistency at intermediate service temperature	**C and T**	**2+**
Consistency at elevated service temperature	**T**	**2+**
Impact cohesion for polymer or latex modified emulsions Applies to recovered binders of emulsions used in **thin** applied final paving products (surface dressing, micro-surfacing) which are subjected to short duration traffic loads (impact loading).	**T**	**2+**
Tensile cohesion for polymer or latex modified emulsions Applies to recovered binders of emulsions used in cold paving mixes of a certain thickness which are working in flexural (bending) mode rather than under impact loading.	**T**	**2+**
Comment: unmodified bitumen has intrinsic cohesive properties that are adequate for its normal use and are demonstrated by measurement of consistency at intermediate and elevated service		

temperatures.		
Elastic recovery at intermediate service temperature for recovered binders from polymer or latex modified emulsions	**T**	**2+**
Essential characteristics applicable to a stabilised binder		
The stabilised binder is the binder obtained when submitting the recovered binder to a standard curing or hardening procedure. The performance of the stabilised binder conditions the behaviour to be expected during service life.		
Consistency and evolution of consistency with temperature		
Consistency and its dependence upon temperature are given by the assessment of both:		
✓ **Consistency at intermediate service temperature**	**C and T**	**2+**
✓ **Consistency at elevated service temperature**	**T**	**2+**
Brittleness at low service temperature	**T**	**2+**
Impact cohesion for polymer or latex modified emulsions	**T**	**2+**
Applies to stabilised binders of emulsions used in **thin** applied final paving products (surface dressing, micro-surfacing) which are subjected to short duration traffic loads (impact loading).		
Tensile cohesion for polymer or latex modified emulsions	**T**	**2+**
Applies to stabilised binders of emulsions used in cold paving mixes of a certain thickness which are working in flexural (bending) mode rather than under impact loading.		
Comment: unmodified bitumen has intrinsic cohesive properties that are adequate for its normal use and are demonstrated by measurement of consistency at intermediate and elevated service temperatures.		
Elastic recovery at intermediate service temperature for stabilised binders from polymer or latex modified emulsions	**T**	**2+**
Evolution of consistency at elevated service temperature after an accelerated ageing procedure	**T ***	**2+**
Conditions the cohesion and brittleness of the binder after long term ageing.		
Comment: after long term ageing, it is low temperature performance which is most critical, but existing test methods are either not sufficiently reliable (e.g. Fraass breaking point) or without sufficient available background experience (BBR).		

*** for this characteristic class(es) or threshold(s) in the cited version will be modified**

2.2.2. BWR 2: Safety in case of fire

No standardization needs identified

2.2.3. BWR 3: Hygiene, health and the environment

No standardization needs identified

2.2.4. BWR 4: Safety and accessibility in use

No standardisation needs identified

2.2.5. BWR 5: Protection against noise

No standardization needs identified

2.2.6. BWR 6: Energy economy and heat retention

No standardization needs identified

2.2.7. BWR 7: Sustainable use of natural resources

Essential characteristics (including proxies, if any)	**Class Threshold**	**AVCP system**
<u>Environmental sustainability</u> **<u>Parameters describing environmental impacts</u>:** - Acidification of soil and water potential (AP) - Ozone depletion potential (ODP) - Global warming potential (GWP) - Eutrophication potential (EP) - Photochemical ozone creation potential (POCP) - Depletion of abiotic resources (elements) - Depletion of abiotic resources (fossil fuels) **<u>Parameters describing resource use</u>:** - Use of renewable primary energy excluding renewable primary energy resources used as raw materials - Use of renewable primary energy resources used as raw materials - Total use of renewable primary energy resources (primary energy and primary energy resources used as raw materials) - Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials - Use of non-renewable primary energy resources used as raw materials - Total use of non-renewable primary energy resources (primary energy and primary energy resources used as raw materials) - Use of secondary material - Use of renewable secondary fuels - Use of non-renewable secondary fuels - Use of net fresh water **<u>Other environmental information describing waste categories</u>:** - Hazardous waste disposed - Non-hazardous waste disposed - Radioactive waste disposed **<u>Other environmental information describing output flows</u>:** - Components for re-use - Materials for recycling - Materials for energy recovery		

2.3. EN 14023:2010 for polymer modified bitumens

2.3.1. BWR 1: Mechanical resistance and stability

Essential characteristics (including proxies, if any)	**Class Threshold**	**AVCP system**
Consistency at intermediate service temperature	**C** **	**2+**
Consistency at elevated service temperature	**C** **	**2+**
Viscoelastic behaviour		**2+**
Cohesion	**T** *&**	**2+**
Resistance to flow and deformation		**2+**
Temperature sensitivity		**2+**
Strain Recovery	**T**	**2+**
Durability of strain recovery	**T**	**2+**
Durability of consistency at low service temperature		**2+**
Durability of viscoelastic behaviour		**2+**

*** for this characteristic class(es) or thresholds in the cited version will be modified**

**** for this characteristic a class or a threshold will be created versus cited version**

2.3.2. BWR 2: Safety in case of fire

No standardization needs identified

2.3.3. BWR 3: Hygiene, health and the environment

No standardization needs identified

2.3.4. BWR 4: Safety and accessibility in use

No standardization needs identified

2.3.5. BWR 5: Protection against noise

No standardization needs identified

2.3.6. BWR 6: Energy economy and heat retention

No standardization needs identified

2.3.7. BWR 7: Sustainable use of natural resources

Essential characteristics (including proxies, if any)	**Class Threshold**	**AVCP system**
<u>Environmental sustainability</u> **<u>Parameters describing environmental impacts</u>:** - Acidification of soil and water potential (AP) - Ozone depletion potential (ODP) - Global warming potential (GWP) - Eutrophication potential (EP) - Photochemical ozone creation potential (POCP) - Depletion of abiotic resources (elements) - Depletion of abiotic resources (fossil fuels) **<u>Parameters describing resource use</u>:** - Use of renewable primary energy excluding renewable primary energy resources used as raw materials - Use of renewable primary energy resources used as raw materials - Total use of renewable primary energy resources (primary energy and primary energy resources used as raw materials) - Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials - Use of non-renewable primary energy resources used as raw materials - Total use of non-renewable primary energy resources (primary energy and primary energy resources used as raw materials) - Use of secondary material - Use of renewable secondary fuels - Use of non-renewable secondary fuels - Use of net fresh water **<u>Other environmental information describing waste categories</u>:** - Hazardous waste disposed - Non-hazardous waste disposed - Radioactive waste disposed **<u>Other environmental information describing output flows</u>:** - Components for re-use - Materials for recycling - Materials for energy recovery		

2.4. EN 15322 for cut-back and fluxed bituminous binders

2.4.1. BWR 1: Mechanical resistance and stability

Essential characteristics (including proxies, if any)	**Class Threshold**	**AVCP system**
Essential characteristics applicable to the binder as such		
Viscosity	**C and T**	**2+**
Comment: viscosity of cut-back and fluxed bituminous binders has a much heavier impact on the performance of the final paving product (it conditions the wetting of aggregates in surface dressing applications) than in the case of bituminous emulsions. This is why it should be considered as an Essential Characteristic.		
Water effect on binder adhesion	**T**	**2+**
Adhesivity by water immersion test performed on an aggregate which has been coated with the bituminous product and subjected to a standard curing procedure.		
Setting ability for cut-back or fluxed bituminous binders incorporating a mineral (volatile) type of flux oil	**C and T**	**2+**
Described by the distillation characteristics of the product.		
Consistency at initial stage for cut-back or fluxed bituminous binders incorporating a vegetal (non-volatile) type of flux oil	**T**	**2+**
Consistency at elevated service temperature measured after a short-term curing procedure.		
Essential characteristics applicable to a stabilised binder		
The stabilised binder is the binder obtained when submitting the cut-back or fluxed bituminous binder to a standard procedure aiming at the evaporation of the flux oil (volatile flux) or at its hardening (non-volatile flux). The performance of the stabilised binder conditions the behaviour to be expected during service life.		
Consistency and evolution of consistency with temperature		
Consistency and its dependence upon temperature are given by the assessment of both:		
✓ **Consistency at intermediate service temperature**	**C and T**	**2+**
✓ **Consistency at elevated service temperature**	**C and T**	**2+**
Impact cohesion for polymer or latex modified products	**T**	**2+**
Applies to the stabilised binder of products used in **thin** applied final paving products (surface dressing) which are subjected to short duration traffic loads (impact loading).		
Tensile cohesion for polymer or latex modified products	**T**	**2+**
Applies to the stabilised binder of products used in paving mixes of a certain thickness which are working in flexural (bending) mode		

rather than under impact loading. Comment 1: unmodified bitumen has intrinsic cohesive properties that are adequate for its normal use and are demonstrated by measurement of consistency at intermediate and elevated service temperatures. Comment 2: tensile cohesion (which corresponds to tensile test or force-ductility) has been introduced here since it exists in the present EN 15322 but is rather theoretical since fluxed binders used in coating applications (storable mixes, deferred use mixes) are not modified in the present state of the art.		
Elastic recovery at intermediate service temperature for polymer or latex modified products	**T**	**2+**
Evolution of consistency at elevated service temperature after an accelerated ageing procedure Conditions the cohesion and brittleness of the binder after long term ageing. *Comment: after long term ageing, it is low temperature performance which is most critical, but existing test methods are either not sufficiently reliable (e.g. Fraass breaking point) or without sufficient available background experience (BBR).*		**2+**

2.4.2. BWR 2: Safety in case of fire

No standardization needs identified

2.4.3. BWR 3: Hygiene, health and the environment

No standardization needs identified

2.4.4. BWR 4: Safety and accessibility in use

No standardization needs identified

2.4.5. BWR 5: Protection against noise

No standardization needs identified

2.4.6. BWR 6: Energy economy and heat retention

No standardization needs identified

2.4.7. BWR 7: Sustainable use of natural resources

Essential characteristics (including proxies, if any)	**Class Threshold**	**AVCP system**
<u>Environmental sustainability</u> **<u>Parameters describing environmental impacts</u>:** - Acidification of soil and water potential (AP) - Ozone depletion potential (ODP) - Global warming potential (GWP) - Eutrophication potential (EP) - Photochemical ozone creation potential (POCP) - Depletion of abiotic resources (elements) - Depletion of abiotic resources (fossil fuels) **<u>Parameters describing resource use</u>:** - Use of renewable primary energy excluding renewable primary energy resources used as raw materials - Use of renewable primary energy resources used as raw materials - Total use of renewable primary energy resources (primary energy and primary energy resources used as raw materials) - Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials - Use of non-renewable primary energy resources used as raw materials - Total use of non-renewable primary energy resources (primary energy and primary energy resources used as raw materials) - Use of secondary material - Use of renewable secondary fuels - Use of non-renewable secondary fuels - Use of net fresh water **<u>Other environmental information describing waste categories</u>:** - Hazardous waste disposed - Non-hazardous waste disposed - Radioactive waste disposed **<u>Other environmental information describing output flows</u>:** - Components for re-use - Materials for recycling - Materials for energy recovery		

PART D: Properties not linked to any BWR but required for operational installation

It is recognised that the following characteristics are not in relation with any BWR but are necessary for operational installation of the Product.

1. Characteristics useful for operational installation for new candidate harmonized European standards listed in Table 1 of Annex I

1.1 EN 13924-1

Characteritics to consider	Justification
Change in mass after short term ageing	Safety in operation, product needs to contain only very limited amounts of volatile components
Flash point	Safety in operation, product needs to be handled at temperatures before flash point
Solubility	Handling of product at asphalt mixing plant, product should not be contaminated by particles
Kinematic Viscosity at 135°C	Handling of product and mixture design

1.2 EN 13924-2

Characteritics to consider	Justification
Change in mass after short term ageing	Safety in operation, product needs to contain only very limited amounts of volatile components
Flash point	Safety in operation, product needs to be handled at temperatures before flash point
Solubility	Handling of product at asphalt mixing plant, product should not be contaminated by particles
Kinematic Viscosity at 135°C	Handling of product and mixture design

2. Characteristics useful for operational installation for new candidate harmonized European standards listed in Table 2 of Annex I

2.1. EN 12591

Characteristics to consider	Justification
Change in mass after short term ageing	Safety in operation, product needs to contain only very limited amounts of volatile components
Flash point	Safety in operation, product needs to be handled at temperatures before flash point
Solubility	Handling of product at asphalt mixing plant, product should not be contaminated by particles
Kinematic or Dynamic Viscosity at 135°C	Handling of product and mixture design

2.2. EN 13808

Characteristics to consider	Justification
Binder content	This information is necessary for the determination of the amount of emulsion which is to be incorporated in the final bituminous paving product.
Distillate content	Same justification as above.
Sieve residue	Large size bitumen droplets may lead to clogging of filters and spraying nozzles when handling and applying the emulsion. The amount of such oversized droplets must therefore be verified.
Storage stability and settling tendency	Storage stability characterizes the evolution of droplet size through coalescence during storage. Settling tendency characterizes the segregation of droplets from top to bottom of a storage tank over time. The knowledge of both characteristics is important for the definition of adequate operational measures (maximum storage time, regular stirring, …).
Breaking behaviour in the presence of filler and fines mixing time	For most emulsion applications, breaking in presence of filler and fines mixing time are not in direct relation to end-product performance (and can therefore not be considered as being Essential Characteristics) but they are useful quick indicators for checking the type of emulsion (rapid, medium or slow breaking).

Mixing stability with cement	Same considerations as above for over-stabilized emulsions used for micro-surfacing and other cold mix applications.
Viscosity	The viscosity of an emulsion has an impact on operational aspects such as ease of spraying, run-off and ease of coating. Unlike what has been done in the previous answers to Mandate M124, it should however not be considered as being an Essential Characteristic since it does not directly condition any of the BWR's applicable to the final paving works.

2.3. EN 14023

Characteristics to consider	Justification
Storage stability	Product is stored in tanks and needs to provide stability during storage to enable product being ready for use
Change in mass after short term ageing	Safety in operation, product needs to contain only very limited amounts of volatile components
Flash point	Safety in operation, product needs to be handled at temperatures before flash point
Dynamic Viscosity at 100 1/s at 135°C	Handling of product and mixture design

2.4. EN 15322

Characteristics to consider	Justification
Flash point	Safety in operation, product needs to be handled at temperatures below flash- point.
Solubility	Handling of product, product should not be contaminated by particles.