

ROAD MARKING MATERIALS

(Durability against abrasion: UNE-EN 13197:2012+A1:2014)

CERTIFICATE OF DURABILITY TEST

REF.

3919/P-RR-II

Client: EUPINCA S.A.
 C/ Londres 13, Pol. Ind. Cabezo Beaza
 30353 CARTAGENA - Murcia - ESPAÑA

Issue date: October 05th, 2016



1.- TESTED ROAD MARKING SYSTEM

A) IDENTIFICATION

MATERIALS IDENTIFICATION, TRADE MARK NAME AND TYPE OF APPLICATION		MANUFACTURER(S)	Thickness (µm)	Dossage (g/m ²)
Nature:	White acrylic paint	EUPINCA S.A.	-	850
Trade mark ¹ :	TKROM ACRÍLICO TRÁFICO PRO			
Applied by:	Spray	SOVITEC		480
Nature:	Glass beads			
Trade mark ² :	ECHOSTAR 20 SBP			
Applied by:	Drop-on			
TYPE OF MATERIAL: White acrylic paint without premix glass beads applied by spray and with drop-on glass beads.				
CHARACTERISTIC OF THE ROAD MARKING: (in accordance with UNE-EN 1436:2009+A1:2009)			Not structured	

- The characteristics of identification of the material can be obtained from the own manufacturer or in this laboratory with his authorization.
- The tested material is identified by its CE Declaration of Conformity and their accompanying documents.

B) TEST RESULTS: on roughness (in accordance with UNE-EN 13197:2012+A1:2014)

RG2

REQUIREMENTS OF THE ROAD MARKING SYSTEM in accordance with UNE-EN 1436:2009+A1:2009			DURABILITY expressed in TRAFFIC CLASSES, in accordance with UNE-EN 13197:2012+A1:2014			
According to the intended use of the road marking system, not all requirements are necessary			Expressed in	P0	P4	P5
Night-time visibility	Coefficient of retro reflected luminance R _L	dry	Class (R)	R5	R4	R4
		rain	Class (RR)	RR2	RR2	RR1
		wet	Class (RW)	RW5	RW4	RW3
Day-time visibility	Luminance coefficient in diffuse illumination Q _d		Class (Q)	Q5	Q5	Q5
		or luminance factor β	Class (B)	B5	B5	B5
		Chromaticity coordinates (x,y)	Pass / Not Pass	pass	pass	pass
Skid resistance	SRT units		Class (S)	S2	S2	S2
Type	Type road marking system		Type I / II	II		
NO PICKUP-TIME: In accordance with UNE-EN 13197:2012+A1:2014			Class (T)	T4		

Date of start of the test: **August 8th, 2016** Date of end of the test: **August 29th, 2016**

CERTIFICATE OF DURABILITY TEST	Ref.	Issue date	Laboratory Manager	Document reference
This certificate is identical to the original spanish version.	3919/P-RR-II	October 05th, 2016	<i>[Signature]</i> D. Francisco J. Guerra	17-MC Rev. 0 Page 1 of 2

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2.- TEST CONDITIONS:

in accordance with the specifications given in UNE-EN 13197:2012+A1:2014

Test plates:	1	Roughness:	RG2	Size:	G
Conditions during application:	t ^{amb} : 32°C	HR:	24%	Material temperature (thermoplastic) °C:	-
Materials applied, % deviation on requested:	Film maker material: -3,06	Glass beads:	0,00	Others materials:	-
	Antiskid aggregates: -	Mixture:	-	Premix:	-
Test Tyres:	NEUMÁTICO COMERCIAL 205/60 R15				
Number of wheels:	4				
Load on wheels (N):	3000 ± 300				
Tyre air pressure (Mpa):	0,25 ± 0,02				
Support angle (degrees):	0° ± 20'				
Steering angle (degrees):	alternating + 1° (± 10') / - 1° (± 10')				
Room temperature:	between + 5°C y + 10°C				
Drying cycle:	In accordance with UNE-EN 13197:2012+A1:2014				
Periodicity of measurements:	0,01; 0,1; 0,2; 0,5; 1,0; 2,0; 3,0 and 4,0 x 10 ⁶ wheel passages				
Desviations:					

3.- PASS/FAIL CRITERIA:

PERFORMANCE REQUIREMENTS OF THE ROAD MARKING ASSEMBLY in accordance with UNE-EN 1436:2009+A1:2009		
CHARACTERISTIC		TECHNICAL CLASSES AND MINIMUM VALUES
Night-time visibility under conditions: ² ·lx ⁻¹	R _L DRY	R2 (100) ¹ - R1 (80) ²
	R _L RAIN	RR1 (25)
	R _L WET	RW1 (25)
Day-time visibility	(x,y)	inside the relevant polygon
	β	B2 (0,3) ¹ - B1 (0,2) ²
Skid resistance	Qd (mcd·m ² ·lx ⁻¹)	Q2 (100) ¹ - Q1 (80) ²
	SRT	S1 (45)

1) For white colour.
2) For yellow colour.

TRAFFIC CLASSES AND REQUIRED N° OF ROLL-OVERS in accordance with UNE-EN 13197:2012+A1:2014	
TRAFFIC CLASS	N° ROLL-OVERS x 10 ⁶
P0	<0,05
P1	0,05 (optional)
P2	0,1
P3	0,2
P4	0,5
P5	1,0
P6	2,0
P7	4,0

4.- TEST RESULTS: initial and retained values and their technical classes

in accordance with UNE-EN 1436:2009+A1:2009

CHARACTERISTIC		value and for each number of roll-overs x 10 ⁶						Uncertainty
		0,01 (P0)	0,1 (P2)	0,2 (P3)	0,5 (P4)	1,0 (P5)		
Night-time visibility R _L (mcd·m ² ·lx ⁻¹)	dry	348	338	327	293	254		± 7 %
	rain	48	50	35	35	27		± 8 %
	wet	118	96	87	80	63		± 8 %
Day-time visibility	x	0,328	0,328	0,329	0,330	0,330		± 0,004
	y	0,348	0,349	0,349	0,350	0,350		± 0,004
	β	0,659	0,637	0,653	0,641	0,632		± 0,013
	Qd (mcd·m ² ·lx ⁻¹)	214	216	222	218	217		± 8 %
Skid resistance	SRT	51	50	50	50	50		± 5
	Temperature water used in the test (°C)	31	30	30	23	25		± 0,2

5.- KEY WORDS FOR IDENTIFICATION OF ROAD MARKING ASSEMBLY:

There are three groups of key words:

A first key word to identify if is for permanent or for temporary purposes.

- P For a permanent road marking assembly.
- T For a temporary road marking assembly.

A second key to identify the retroreflective properties of the road marking assembly:

- R For a road marking assembly retroreflective under dry conditions.
- RW For a road marking assembly retroreflective under dry and wet conditions.
- RR For a road marking assembly retroreflective under dry, wet and rain conditions.
- NR For a road marking assembly not retroreflective.

A third key to identify the type of the road marking assembly:

- I For a conventional road marking.
- II For a road marking assembly with special properties to enhance the retroreflection on wet or/and rainy conditions.

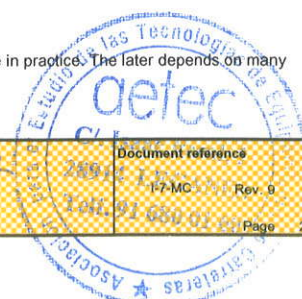
6.- NOTE:

The results in this report relate only to the samples tested and cannot be extended to other manufacturer's production.

The results achieved by a road marking assembly on the durability test, shall not be interpreted as being a guarantee for working life in practice. The later depends on many factors beyond the materials such as design, location (type of road surface, weather conditions, etc) and application conditions.

CERTIFICATE OF DURABILITY TEST	Ref.	Issue date	Laboratory Manager	Document reference
This certificate is identical to the original spanish version.	3919/P-RR-II	October 05th, 2016	D. Francisco J. Guerra	17-MC Rev. 0
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ROAD MARKING MATERIALS

(Durability against abrasion: UNE-EN 13197:2012+A1:2014)

CERTIFICATE OF DURABILITY TEST

REF.

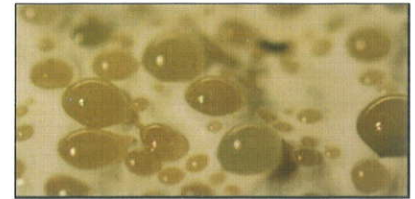
3919/P-RW-II

Client: EUPINCA S.A.
 C/ Londres 13, Pol. Ind. Cabezo Beaza
 30353 CARTAGENA - Murcia - ESPAÑA

Issue date: October 05th, 2016

1.- TESTED ROAD MARKING SYSTEM

A) IDENTIFICATION



MATERIALS IDENTIFICATION, TRADE MARK NAME AND TYPE OF APPLICATION		MANUFACTURER(S)	Thickness (µm)	Dossage (g/m ²)
Nature:	White acrylic paint	EUPINCA S.A.	-	850
Trade mark ¹ :	TKROM ACRÍLICO TRÁFICO PRO			
Applied by:	Spray	SOVITEC		480
Nature:	Glass beads			
Trade mark ² :	ECHOSTAR 20 SBP			
Applied by:	Drop-on			
TYPE OF MATERIAL: White acrylic paint without premix glass beads applied by spray and with drop-on glass beads.				
CHARACTERISTIC OF THE ROAD MARKING: (in accordance with UNE-EN 1436:2009+A1:2009)			Not structured	

1) The characteristics of identification of the material can be obtained from the own manufacturer or in this laboratory with his authorization.

2) The tested material is identified by its CE Declaration of Conformity and their accompanying documents.

B) TEST RESULTS: on roughness (in accordance with UNE-EN 13197:2012+A1:2014)

RG2

REQUIREMENTS OF THE ROAD MARKING SYSTEM in accordance with UNE-EN 1436:2009+A1:2009				DURABILITY expressed in TRAFFIC CLASSES, in accordance with UNE-EN 13197:2012+A1:2014				
According to the intended use of the road marking system, not all requirements are necessary			Expressed in	P0	P4	P5	P6	P7
Night-time visibility	Coefficient of retro reflected luminance R _L	dry	Class (R)	R5	R4	R4	R4	R3
		wet	Class (RW)	RW5	RW4	RW3	RW3	RW2
Day-time visibility	Luminance coefficient in diffuse illumination Q _d	or luminance factor β	Class (Q)	Q5	Q5	Q5	Q5	Q5
			Class (B)	B5	B5	B5	B5	B5
	Chromaticity coordinates (x,y)	Pass / Not Pass	pass	pass	pass	pass	pass	
Skid resistance	SRT units		Class (S)	S2	S2	S2	S2	S2
Type	Type road marking system		Type I / II	II				
NO PICKUP-TIME: In accordance with UNE-EN 13197:2012+A1:2014			Class (T)	T4				

Date of start of the test: **August 8th, 2016**

Date of end the test: **August 29th, 2016**

CERTIFICATE OF DURABILITY TEST	Ref.	Issue date	Laboratory Manager	Document reference
This certificate is identical to the original spanish version.	3919/P-RW-II	October 05th, 2016	<i>[Signature]</i> D. Francisco J. Guerra	Rev. 9 Page 1 of 2

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2.- TEST CONDITIONS:

in accordance with the specifications given in UNE-EN 13197:2012+A1:2014

Test plates:	1	Roughness:	RG2	Size:	G
Conditions during application:	t ^{amb} : 32°C	HR:	24%	Material temperature (thermoplastic) °C:	-
Materials applied, % deviation on requested:	Film maker material: -3,06	Glass beads:	0,00	Others materials:	-
	Antiskid aggregates:	Mixture:	-	Premix:	-
Test Tyres:	NEUMÁTICO COMERCIAL 205/60 R15				
Number of wheels:	4				
Load on wheels (N):	3000 ± 300				
Tyre air pressure (Mpa):	0,25 ± 0,02				
Support angle (degrees):	0° ± 20'				
Steering angle (degrees):	alternating + 1° (± 10') / - 1° (± 10')				
Room temperature:	between + 5°C y + 10°C				
Drying cycle:	In accordance with UNE-EN 13197:2012+A1:2014				
Periodicity of measurements:	0,01; 0,1; 0,2; 0,5; 1,0; 2,0; 3,0 and 4,0 x 10 ⁶ wheel passages				
Desviations:					

3.- PASS/FAIL CRITERIA:

PERFORMANCE REQUIREMENTS OF THE ROAD MARKING ASSEMBLY in accordance with UNE-EN 1436:2009+A1:2009		
CHARACTERISTIC		TECHNICAL CLASSES AND MINIMUM VALUES
Night-time visibility under conditions: (mcd·m ⁻² ·lx ⁻¹)	R _L DRY	R2 (100) ¹ - R1 (80) ²
	R _L RAIN	RR1 (25)
	R _L WET	RW1 (25)
Day-time visibility	(x,y)	inside the relevant polygon
	β	B2 (0,3) ¹ - B1 (0,2) ²
	Qd (mcd·m ⁻² ·lx ⁻¹)	Q2 (100) ¹ - Q1 (80) ²
Skid resistance	SRT	S1 (45)

1) For white colour.
2) For yellow colour.

TRAFFIC CLASSES AND REQUIRED N° OF ROLL-OVERS in accordance with UNE-EN 13197:2012+A1:2014	
TRAFFIC CLASS	N° ROLL-OVERS x 10 ⁶
P0	<0,05
P1	0,05 (optional)
P2	0,1
P3	0,2
P4	0,5
P5	1,0
P6	2,0
P7	4,0

4.- TEST RESULTS: initial and retained values and their technical classes

in accordance with UNE-EN 1436:2009+A1:2009

CHARACTERISTIC		value and for each number of roll-overs x 10 ⁶								Uncertainty
		0,01 (P0)	0,1 (P2)	0,2 (P3)	0,5 (P4)	1,0 (P5)	2,0 (P6)	3,0	4,0 (P7)	
Night-time visibility R _L (mcd·m ⁻² ·lx ⁻¹)	dry	348	338	327	293	254	233	208	194	± 7 %
	wet	118	96	87	80	63	67	47	43	± 8 %
Day-time visibility	x	0,328	0,328	0,329	0,330	0,330	0,330	0,331	0,333	± 0,004
	y	0,348	0,349	0,349	0,350	0,350	0,350	0,351	0,353	± 0,004
	β	0,659	0,637	0,653	0,641	0,632	0,618	0,639	0,629	± 0,013
	Qd (mcd·m ⁻² ·lx ⁻¹)	214	216	222	218	217	211	213	221	± 8 %
Skid resistance	SRT	51	50	50	50	50	50	52	52	± 5
	Temperature water used in the test (°C)	31	30	30	23	25	25	25	30	± 0,2

5.- KEY WORDS FOR IDENTIFICATION OF ROAD MARKING ASSEMBLY:

There are three groups of key words:

A first key word to identify if is for permanent or for temporary purposes.

- P For a permanent road marking assembly.
- T For a temporary road marking assembly.

A second key to identify the retroreflective properties of the road marking assembly:

- R For a road marking assembly retroreflective under dry conditions.
- RW For a road marking assembly retroreflective under dry and wet conditions.
- RR For a road marking assembly retroreflective under dry, wet and rain conditions.
- NR For a road marking assembly not retroreflective.

A third key to identify the type of the road marking assembly:

- I For a conventional road marking.
- II For a road marking assembly with special properties to enhance the retroreflection on wet or/and rainy conditions.

6.- NOTE:

The results in this report relate only to the samples tested and cannot be extended to other manufacturer's production.

The results achieved by a road marking assembly on the durability test, shall not be interpreted as being a guarantee for working life in practice. The latter depends on many factors beyond the materials such as design, location (type of road surface, weather conditions, etc) and application conditions.

CERTIFICATE OF DURABILITY TEST	Ref.	Issue date	Laboratory Manager	Document reference
	3919/P-RW-II	October 05th, 2016	<i>Francisco J. Guerra</i>	CI-Isaac P-17-MC Rev. 9
This certificate is identical to the original spanish version.			Page 2 of 2	

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ROAD MARKING MATERIALS

(Durability against abrasion: UNE-EN 13197:2012+A1:2014)

CERTIFICATE OF DURABILITY TEST

REF.

3745/P-R-I/A1

Client: EUPINCA S.A.
 C/ Londres 13, Pol. Ind. Cabezo Beaza
 30353 CARTAGENA - Murcia - ESPAÑA

Issue date: May 18th, 2016
 This certificate substitutes the former with number 3745/P-R-I due to it had editorial mistakes.



1.- TESTED ROAD MARKING SYSTEM

A) IDENTIFICATION

MATERIALS IDENTIFICATION, TRADE MARK NAME AND TYPE OF APPLICATION		MANUFACTURER(S)	Thickness (µm)	Dossage (g/m ²)
Nature:	White acrylic paint			
Trade mark ¹ :	TKROM ACRÍLICO TRÁFICO PROFESIONAL	EUPINCA S.A.	X	720
Applied by:	Spray			
Nature:	Glass beads			
Trade mark ² :	ECHOSTAR 5	SOVITEC		480
Applied by:	Drop-on			
Nature:	X			
Trade mark ¹ :	X	X		X
Applied by:	X			
TYPE OF MATERIAL: White acrylic paint without premix glass beads applied by spray and with drop-on glass beads.				
CHARACTERISTIC OF THE ROAD MARKING: (in accordance to UNE-EN 1436:2009+A1:2009)			Not structured	

- 1) The characteristics of identification of the material can be obtained from the own manufacturer or in this laboratory with his authorization.
- 2) The tested material is identified by its CE Declaration of Conformity and their accompanying documents.

B) TEST RESULTS: on roughness (in accordance to UNE-EN 13197:2012+A1:2014)

RG2

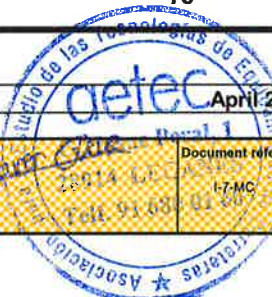
REQUIREMENTS OF THE ROAD MARKING SYSTEM in accordance to UNE-EN 1436:2009+A1:2009			DURABILITY expressed in TRAFFIC CLASSES, in accordance to UNE-EN 13197:2012+A1:2014					
According to the intended use of the road marking system, not all requirements are necessary			Expressed in	P0	P4	P5	P6	P7
Night-time visibility	Coefficient of retro reflected luminance R_L	dry	Class (R)	R5	R4	R4	R4	R3
Day-time visibility	Luminance coefficient in diffuse illumination Q_d		Class (Q)	Q5	Q5	Q5	Q5	Q5
	or luminance factor β		Class (B)	B5	B5	B5	B5	B3
	Chromaticity coordinates (x,y)		Pass / Not Pass	pass	pass	pass	pass	pass
Skid resistance	SRT units		Class (S)	S4	S3	S3	S3	S3
Type	Type road marking system		Type I / II	I				
NO PICKUP-TIME: In accordance with UNE-EN 13197:2012+A1:2014			Class (T)	T3				

Date of start of the test: **March 28th, 2016** Date of end the test: **April 25th, 2016**

CERTIFICATE OF DURABILITY TEST	Ref.	Issue date	Laboratory Manager	Document reference
This certificate is identical to the original spanish version.	3745/P-R-I/A1	May 18th, 2016	<i>Francisco J. Guerra</i> Dr. Francisco J. Guerra	1-7-MC Rev. 0 Page 1 of 2

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2.- TEST CONDITIONS:

in accordance with the specifications given in UNE-EN 13197:2012+A1:2014

Test plates:	1	Roughness:	RG2	Size:	G	
Conditions during application:	t° amb: 17°C	HR:	34%	Material temperature (thermoplastic) °C:	x	
Materials applied, % deviation on requested:	Film maker material:	-1,11	Glass beads:	0,00	Others materials:	x
	Antiskid aggregates:	x	Mixture:	x	Premix:	x
Test Tyres:	NEUMÁTICO COMERCIAL 205/60 R15					
Numer of wheels:	4					
Load on wheels (N):	3000 ± 300					
Tyre air pressure (Mpa):	0,25 ± 0,02					
Support angle (degrees):	0° ± 20°					
Steering angle (degrees):	alternating + 1° (± 10') / - 1° (± 10')					
Room temperature:	between + 5°C y + 10°C					
Drying cycle:	In accordance to UNE-EN 13197:2012+A1:2014					
Periodicity of measurements:	0,01; 0,1; 0,2; 0,5; 1,0; 2,0; 3,0 and 4,0 x 10 ⁶ wheel passages					
Desviations:						

3.- PASS/FAIL CRITERIA:

PERFORMANCE REQUIREMENTS OF THE ROAD MARKING ASSEMBLY in accordance to UNE-EN 1436:2009+A1:2009		
CHARACTERISTIC		TECHNICAL CLASSES AND MINIMUM VALUES
Night-time visibility under conditions: (mcd·m ⁻² ·lx ⁻¹)	R _t DRY	R2 (100) ¹ - R1 (80) ²
	R _t RAIN	RR1 (25)
	R _t WET	RW1 (25)
Day-time visibility	(x,y)	inside the relevant polygon
	β	B2 (0,3) ¹ - B1 (0,2) ²
	Qd (mcd·m ⁻² ·lx ⁻¹)	Q2 (100) ¹ - Q1 (80) ²
Skid resistance	SRT	S1 (45)

1) For white colour.
2) For yellow colour.

TRAFFIC CLASSES AND REQUIRED N° OF ROLL-OVERS in accordance to UNE-EN 13197:2012+A1:2014	
TRAFFIC CLASS	N° ROLL-OVERS x 10 ⁶
P0	<0,05
P1	0,05 (optional)
P2	0,1
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P7	4,0

4.- TEST RESULTS: initial and retained values and their technical classes

in accordance to UNE-EN 1436:2009+A1:2009

CHARACTERISTIC		value and for each number of roll-overs x 10 ⁶								Uncertainty
		0,01 (P0)	0,1 (P2)	0,2 (P3)	0,5 (P4)	1,0 (P5)	2,0 (P6)	3,0	4,0 (P7)	
Night-time visibility R _t (mcd·m ⁻² ·lx ⁻¹)	dry	324	310	289	263	251	201	192	192	± 9 %
Day-time visibility	x	0,332	0,332	0,332	0,333	0,332	0,334	0,334	0,339	± 0,004
	y	0,354	0,353	0,353	0,354	0,353	0,355	0,356	0,358	± 0,004
	β	0,640	0,635	0,619	0,624	0,619	0,604	0,591	0,475	± 0,013
	Qd (mcd·m ⁻² ·lx ⁻¹)	238	237	228	231	243	214	212	219	± 7 %
Skid resistance	SRT	60	59	54	57	55	57	55	55	± 5
	Temperature water used in the test (°C)	14	14	14	14	13	14	14	14	± 0,2

5.- KEY WORDS FOR IDENTIFICATION OF ROAD MARKING ASSEMBLY:

There are three groups of key words:

A first key word to identify if is for permanent or for temporary purposes.

- P For a permanent road marking assembly.
- T For a temporary road marking assembly.

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- RW For a road marking assembly retrorreflective under dry and wet conditions.
- RR For a road marking assembly retrorreflective under dry, wet and rain conditions.
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A third key to identify the type of the road marking assembly:

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6.- NOTE:

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This certificate is identical to the original spanish version.	3745/P-R-II/A1	May 18th, 2016	<i>Francisco J. Gueda</i>	I-7-MC Rev. 0
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