

ROAD MARKING MATERIALS

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

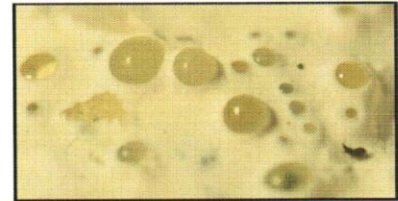
CERTIFICATE OF DURABILITY TEST

REF.

4124/P-RR-II

Client: **SWARCO VICAS**
Soseaua Gaesti 8
130087 TARGOVISTE - Romania

Issue date: **May 4th, 2017**



1.- TESTED ROAD MARKING SYSTEM

A) IDENTIFICATION

MATERIALS IDENTIFICATION, TRADE MARK NAME AND TYPE OF APPLICATION		MANUFACTURER(S)	Thickness (µm)	Dossage (g/m²)
Nature:	White acrylic paint			
Trade mark¹:	SWARCOMARK SV 200	SWARCO VICAS	600	920
Applied by:	Spray			
Nature:	Glass beads and antiskid aggregates			
Trade mark²:	SWARCOLUX 50 212-1400 T14 M20	M. SWAROVSKI GmbH		450
Applied by:	Drop-on			
TYPE OF MATERIAL: White acrylic paint without premix glass beads applied by spray and with a mixture of drop-on glass beads and antiskid aggregates.				
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 necesaries			Expressed in	P0	P4	P5	P6	P7
Night-time visibility	Coefficient of retro reflected luminance R_L	dry	Class (R)	R4	R4	R3	R3	R3
		rain	Class (RR)	RR5	RR2	RR2	RR2	RR1
		wet	Class (RW)	RW6	RW5	RW5	RW4	RW4
Day-time visibility	Luminance coeficient in diffuse illumination Q_d		Class (Q)	Q5	Q5	Q5	Q5	Q5
	or luminance factor β		Class (B)	B5	B5	B5	B5	B5
	Chromatcity coordinates (x - y)		Pass / Not Pass	pass	pass	pass	pass	pass
Skid resistance	SRT units		Class (S)	S2	S1	S1	S1	S2
Wear	Percentage of wear (remaining road marking)		%	100	96	95	94	92
Type	Type road marking system		Type I / II	II				
NO PICKUP-TIME: In accordance with UNE-EN 13197:2012+A1:2014			Class (T)	T2				

Date of start of the test: **March 6th, 2017** Date of end of the test: **March 30th, 2017**

CERTIFICATE OF DURABILITY TEST	Ref.	Issue date	Laboratory Manager	Document reference
This certificate is identical to the original spanish version.	4124/P-RR-II	May 4th, 2017	<i>Francisco J. Guerra</i> D. Francisco J. Guerra	C/ Isaac Peral, 1 28914 LEGANES Tel. 91 680 01 60 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 ^a amb: 16°C	HR:	46%	Material temperature (thermoplastic) °C:	-
Materials applied, % deviation on requested:	Film maker material: 2,72	Glass beads:	-	Others materials:	-
	Antiskid aggregates:	Mixture:	0,00	Premix:	-
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 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				
Deviations:					

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: R_L (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	274	269	240	228	196	186	183	168	± 7 %
	rain	108	69	55	43	39	36	28	29	± 8 %
	wet	210	185	140	128	113	98	81	80	± 8 %
Day-time visibility	x	0,321	0,324	0,327	0,330	0,330	0,331	0,334	0,334	± 0,004
	y	0,341	0,345	0,348	0,351	0,350	0,351	0,354	0,353	± 0,005
	β	0,773	0,747	0,727	0,701	0,707	0,662	0,643	0,637	± 0,016
	Qd (mcd·m ⁻² ·lx ⁻¹)	271	254	246	244	245	239	236	227	± 8 %
Skid resistance	SRT	53	49	49	47	49	48	50	50	± 5
	Temperature water used in the test (°C)	13	14	14	15	14	15	11	14	± 0,2
Percentage of wear (remaining road marking)	%	100	99	98	96	95	94	93	92	± 5%

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
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Traducere din Limba Engleza

aetec

Asociación para el Estudio de las Tecnologías
de Equipamiento de Carreteras, S.A.

sigla **ilac MRA ENA C**
ENSAYOS
Nr. 877/LE1781

Controlul calitatii:

* Test de rezistenta pentru materialele de marcaj rutier

* Marcaj rutier, eficienta utilizarii

C/Isaac Perat, nr.1 (nave 4), E-28914 Leganés (Madrid) – Spania

Tel.+34 916 800 160 * Fax +34 916 886 001 - aetec@aetec.es

MATERIALE MARCAJ RUTIER

(Durabilitatea contra abraziunii: UNE-EN 13197: 2012+A1:2014)

CERTIFICAT DE TEST DE DURABILITATE	REF.	4124/P-RR-II
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Client: SWARCO VICAS
Soseaua Gaesti 8
130087 TARGOVISTE – Romania

Data eliberarii: 4 mai 2017

1. SISTEM DE MARCAJ RUTIER TESTAT

A) IDENTIFICARE

IDENTIFICAREA MATERIALELOR, DENUMIREA MARCII DE COMERT SI TIPUL APLICATIEI		FABRICANTUL/ FABRICANTII	GROSIME (µm)	Dozare (g/m ²)
Felul Marca de comert ¹ : Aplicat prin	Vopsea acrilica alba SWARCOMARK SV 200 Pulverizare	SWARCO VICAS	600	920
Felul Marca de comert ² : Aplicat prin	Perle de sticla si agregate antiderapante SWARCOLUX 50 212-1400 T14 M20 Picurare	M. SWAROVSKI GmbH		450
TIPUL DE MATERIAL: Vopsea acrilica alba fara perle de sticla preamestecate aplicata prin pulverizare si cu un amestec de perle de sticla picurate si agregate antiderapante.				
CARACTERISTICILE MARCAJULUI RUTIER: In conformitate cu UNE-EN 1436:2009 + A1:2009)			Nestructurat	

1) Caracteristicile de identificare ale materialului pot fi obtinute de la producatorul sau sau in acest laborator cu autorizarea sa.

2) Materialul testat este identificat prin Declaratia de Conformitate CE si cu documentele insotitoare.

B) REZULTATELE TESTULUI: asupra rugozitatii (in conformitate cu UNE-EN 13197:2012 + A1:2014) **RG2**

CERINTE PENTRU SISTEMUL DE MARCAJ RUTIER conform UNE-EN 1436:2009 + A1:2009				DURABILITATE exprimata in CLASE DE TRAFIC, conform UNE-EN 13197:2012 + A1:2014				
Conform utilizarii proiectate pentru sistemul de marcaj rutier, nu sunt necesare toate cerintele			Exprimat in	P0	P4	P5	P6	P7
Vizibilitatea pe timp de noapte	Coeficientul luminantei retro reflectate R_L	uscat	Clasa (R)	R4	R4	R3	R3	R3
		ploaie	Clasa (RR)	RR5	RR2	RR2	RR2	RR1
		umed	Clasa (RW)	RW6	RW5	RW5	RW4	RW4
Vizibilitatea pe timpul zilei	Coeficientul de luminanta in iluminare difuza Q_d		Clasa (Q)	Q5	Q5	Q5	Q5	Q5
	sau factor de luminanta β		Clasa (β)	B5	B5	B5	B5	B5
	Coordonatele de cromaticitate (x - y)		Acceptat/ Neacceptat	Acceptat	Acceptat	Acceptat	Acceptat	Acceptat
Rezistenta la derapare	Unitati SRT		Clasa (S)	S2	S1	S1	S1	S2
Uzura	Procent de uzura (marcaj rutier ramas)		%	100	96	95	94	92

ANAISSCONS SRL
Nr. inregistrare 651
Data 16.05.17
Bon fiscal nr. 019

Tipul	Tipul sistemului de marcaj rutier	Tip I / II	II
FARA TIMP DE PRELUARE: Conform UNE-EN 13197:2012+A1:2014		Clasa (T)	T2

Data inceperii testului	6 martie 2017	Data terminarii testului	30 martie 2017
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CERTIFICAT DE TEST DE DURABILITATE Acest certificat este identic cu versiunea originala spaniola	Ref. 4124/P-RR-II	Data eliberarii 4 mai 2017	Director Laborator, <i>Semnatura indescifrabila</i> <i>Stampila rotunda legala a</i> <i>AETEC SA</i> D. Francisco J. Guerra	Referinta document 1-7 MC Rev.9 Pag. 1 din 2
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Situatia valabilitatii certificatului poate fi confirmata pe www.aetec.es

2. CONDITIILE DE TESTARE in conformitate cu specificatiile precizate in UNE-EN 13197:2012+A1:2014

Placuta testare : 1 Rugozitate: RG2 Marime: G
 Conditii in timpul aplicarii: t° mediu amb. 16°C HR: 46%
 Temp. material (termoplastic) °C: *
 Materiale aplicate, % deviere la cerere: Material Peliculogen: 2,72 Perle de sticla: -
 Alte materiale: *
 Agregate antiderapante: - Amestec: 0.00 Preamestec: -
 Anvelope de incercare NEUMATICO COMERCIAL 205/60 R15
 Numar roti: 4
 Incarcarea pe roti (N): 3000 ± 300
 Presiune aer in pneuri (Mpa): 0.25 ± 0.02
 Unghi de sprijin (grade): 0° ± 20°
 Unghi de virare (grade) alternative: +1°(±10') / -1°(±10')
 Temperatura ambianta: intre +5°C y +10°C
 Ciclu de actionare: In conformitate cu UNE-EN 13197:2012+A1:2014
 Periodicitatea masuratorilor: 0.01; 0.1; 0.2; 0.5; 1.0; 2.0; 3.0 si 4.0 x 10⁶ treceri roata
 Abateri :

Simolea Simona Elena
Traducator Autograf
Engleza - Romana
Autografie nr 6068

3. CRITERII DE ACCEPTARE/RESPINGERE:

CERINTE DE PERFORMANTA PENTRU ANSAMBLU MARCAJ RUTIER in conformitate cu UNE-EN 1436:2009+A1:2009			CLASELE DE TRAFIC SI NUMARUL CERUT DE TRECERI in conformitate cu UNE-EN 13197: 2012+A1:2014	
CARACTERISTICI		CLASE TEHNICE SI VALORI MINIME	CLASE DE TRAFIC	NUMAR DE TRECERI x 10 ⁶
Vizibilitate pe timp de noapte in conditiile: (med m ⁻² ·lx ⁻¹)	R _L USCAT	R2(100) ¹ – R1(80) ²	P0	<0.05
	R _L PLOAIE	RR1 (25)	P1	0.05(optional)
	R _L UMED	RW1 (25)	P2	0.1

Vizibilitate pe timpul zilei	(x,y)	In interiorul poligonului relevant	P3	0.2
	β	$B2(0.3)^1 - B1(0.2)^2$	P4	0.5
	$Qd \text{ (mcd.m}^{-2}\text{.lx}^{-1}\text{)}$	$Q2(100)^1 - Q1(80)^2$	P5	1.0
Rezistenta la derapare	SRT	S1(45)	P6	2.0
1) Pentru culoarea alba 2) Pentru culoarea galbena			P7	4.0

4.REZULTATE TEST: valori initiale si inregistrate si clasele lor tehnice in conf. cu UNE-EN1436:2009+A1:2009

CARACTERISTICI		valoare si pentru fiecare numar de treceri x 10 ⁶								Incertitudine
		0.01 (P0)	0.1 (P2)	0.2 (P3)	0.5 (P4)	1.0 (P5)	2.0 (P6)	3.0	4.0 (P7)	
Vizibilitate pe timp de noapte $R_L \text{ (mcd.m}^{-2}\text{.lx}^{-1}\text{)}$	uscat	274	269	240	228	196	186	183	168	±7%
	ploaie	108	69	55	43	39	36	28	29	±8%
	umed	210	185	140	128	113	98	81	80	±8%
Vizibilitate pe timpul zilei	x	0.321	0.324	0.327	0.330	0.330	0.331	0.334	0.334	±0.004
	y	0.341	0.345	0.348	0.351	0.350	0.351	0.354	0.353	±0.005
	β	0.773	0.747	0.727	0.701	0.707	0.662	0.643	0.637	±0.016
	$Qd \text{ (mcd.m}^{-2}\text{.lx}^{-1}\text{)}$	271	254	246	244	245	239	236	227	±8%
Rezistenta la derapare	SRT	53	49	49	47	49	48	50	50	±5
	(temp. apei folosita la test) (°C)	13	14	14	15	14	15	11	14	±0.2
Procentaj uzura (marcaj ramas)	%	100	99	98	96	95	94	93	92	±5%

5. CUVINTE CHEIE PENTRU IDENTIFICAREA ANSAMBLULUI MARCAJ RUTIER :

Sunt trei grupe de cuvinte cheie:

O prima grupa de cuvinte cheie pentru a identifica daca este in scop permanent sau temporar:

P Pentru ansamblu marcaj rutier permanent.

T Pentru ansamblu marcaj rutier temporar.

A doua grupa de cuvinte cheie pentru a identifica proprietatile retroreflective ale ansamblului marcaj rutier:

R Pentru un ansamblu marcaj rutier retroreflectorizant in conditii uscate.

RW Pentru un ansamblu marcaj rutier retroreflectorizant in conditii uscate si umede.

RR Pentru un ansamblu marcaj rutier retroreflectorizant in conditii uscate, umede si de ploaie.

NR Pentru un ansamblu marcaj rutier neretroreflectorizant.

Ing. Irina Simona Elena
 Traducator Autorizat
 Europ. de Traducere
 Autorizata nr. 3448

A treia grupa de cuvinte cheie pentru a identifica tipul ansamblului de marcaj rutier:

- I Pentru marcaj rutier conventional.
- II Pentru ansamblu marcaj rutier cu proprietati speciale care sa mareasca reflectivitatea in conditii de umiditate si/sau ploaie.

6. MENTIUNI:

Rezultatele din acest raport se refera doar la esantioanele testate si nu pot fi extinse la alte produse ale fabricantului.

Rezultatele obtinute pentru un ansamblu de marcaj rutier la testul de durabilitate nu trebuie sa fie interpretate ca o garantie pentru durata de viata in practica. Aceasta din urma depinde de multi factori dincolo de materiale, cum sunt designul, locatia (tipul suprafetei drumului, conditii meteorologice, etc.), precum si de conditiile de aplicare.

CERTIFICAT DE TEST DE DURABILITATE Acest certificat este identic cu versiunea originala spaniola	Ref.	Data eliberarii	Director Laborator, <i>Semnatura indescifrabila</i> <i>Stampila rotunda legala a</i> <i>AETEC SA</i> D. Francisco J. Guerra	Referinta document
	4124/P-RR-II	4 mai 2017		1-7 MC Rev.9 Pag. 2 din 2

Acest CERTIFICAT nu poate fi reprodus partial fara permisiunea AETEC S.A.

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INTERPRET SI TRADUCATOR AUTORIZAT
MANOLESCU SIMONA-ELENA

