

ROAD MARKING MATERIALS

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

CERTIFICATE OF DURABILITY TEST

REF.

4099/PE-RR-II

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

Issue date: April 18th, 2017



1.- TESTED ROAD MARKING SYSTEM

A) IDENTIFICATION

MATERIALS IDENTIFICATION, TRADE MARK NAME AND TYPE OF APPLICATION		MANUFACTURER(S)	Thickness (µm)	Dosage (g/m²)
Nature:	White thermoplastic			
Trade mark¹:	SWARCOTHERM HP62	SWARCO VICAS	3.000	6.000
Applied by:	Extrusion			
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 thermoplastic with premix glass beads applied by extrusion 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+A1:20				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	R5	R5	R4	R4	
		rain	Class (RR)	RR3	RR2	RR2	RR1	RR1	
		wet	Class (RW)	RW6	RW5	RW5	RW4	RW4	
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	B5	
	Chromaticity coordinates (x,y)		Pass / Not Pass	pass	pass	pass	pass	pass	
Skid resistance	SRT units		Class (S)	S3	S1	S1	S1	S1	
Wear	Percentage of wear (remaining road marking)		%	100	100	100	100	100	
Type	Type road marking system		Type I / II	II					
NO PICKUP-TIME: In accordance with UNE-EN 13197:2012+A1:2014			Class (T)	No aplic.					

Date of start of the test: **January 30th, 2017** Date of end of the test: **February 24th, 2017**

CERTIFICATE OF DURABILITY TEST	Ref.	Issue date	Laboratory Manager	Document reference
This certificate is identical to the original spanish version.	4099/PE-RR-II	April 18th, 2017	C. Isaac Peral <i>(Signature)</i> D. Francisco J. Quevedo	7-MC (E) Rev. 9

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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: 14°C	HR:	48%	Material temperature (thermoplastic) °C:	200
Materials applied, % deviation on requested:	Film maker material: -1,30	Glass beads:	-	Others materials:	-
	Antiskid aggregates:	Mixture:	0,00	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				
Deviations:					

3.- PASS/FAIL CRITERIA:

PERFORMANCE REQUIREMENTS OF THE ROAD MARKING ASSEMBLY in accordance with UNE-EN 1436:2009+A1:2009		
CARACTERISTIC	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

CARACTERISTIC		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	412	419	430	410	342	273	237	232	± 7 %
	rain	67	56	44	44	36	29	30	31	± 8 %
	wet	258	182	144	134	129	95	88	83	± 8 %
Day-time visibility	x	0,325	0,327	0,329	0,330	0,333	0,334	0,336	0,338	± 0,004
	y	0,345	0,347	0,350	0,350	0,353	0,354	0,355	0,358	± 0,005
	β	0,704	0,690	0,685	0,684	0,667	0,660	0,663	0,652	± 0,016
	Qd (mcd·m ⁻² ·lx ⁻¹)	245	230	235	237	232	239	241	237	± 8 %
Skid resistance	SRT	56	53	50	49	45	48	46	45	± 5
	Temperature water used in the test (°C)	11	12	12	12	11	10	12	13	± 0,2
Percentage of wear (remaining road marking)	%	100	100	100	100	100	100	100	100	± 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 Limbile Engleza si Spaniola

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

sigla **ilac MRA EN A C**

TESTE

Nr. 877/LE1781

Controlul calitatii:

* Test de durabilitate pentru materiale de marcaj rutier

* Marcaje rutiere: Performanta in utilizare

Str. Isaac Peral, nr.1 (nave 4), E-28914 Leganés (Madrid) – Spania

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

Manolescu Simona Elena
Traducător Autorizat
Engleza / Franceza
Autorizatie nr 8446

MATERIALE MARCAJ RUTIER

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

CERTIFICAT DE TEST DE DURABILITATE		REF.	4099/PE-RR-II	
Client:	SWARCO VICAS Soseaua Gaesti 8 130087 TARGOVISTE – Romania			
Data eliberarii: 18 Aprilie 2017				
1. SISTEM DE MARCAJ RUTIER TESTAT				
A) IDENTIFICARE				
IDENTIFICAREA MATERIALELOR, DENUMIREA MARCII DE COMERT SI TIPUL APLICATIEI		FABRICANTUL/ FABRICANTII	GROSIME (µm)	Dozare (g/m²)
Felul Marca de comert¹: Aplicat prin	Termoplastic Alb SWARCOTHERM HP62 Extrudare	SWARCO VICAS	3.000	6.000
Felul Marca de comert¹: Aplicat prin	Microbile de sticla si agregate antiderapante SWARCOLUX 50 (212-1400 T14 M20) Picurare	M. SWAROVSKI GmbH	-	450
TIPUL DE MATERIAL: Termoplastic alb cu microbile de sticla preamestecate aplicat prin extrudare si cu un amestec de microbile 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 său sau in acest laborator cu autorizarea sa.

2) Materialul testat este identificat prin Declaratia de Conformitate CE si 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+A1:20			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_t	uscata	Clasa (R)	R5	R5	R5	R4	R4
		ploaie	Clasa (RR)	RR3	RR2	RR2	RR1	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 (B)	B5	B5	B5	B5	B5
	Coordonatele de cromaticitate (x - y)		Acceptat Neacceptat	Acceptat	Acceptat	Acceptat	Acceptat	Acceptat

ANALISCONS SRL
Nr. inregistrare _____
Data _____
Baza fiscală nr. _____

Rezistența la derapare	Unitati SRT	Clasa (S)	S3	S1	S1	S1	S1
Uzura	Procentul de uzura (marcaj rutier ramas)	%	100	100	100	100	100
Tipul	Tipul sistemului de marcaj rutier	Tip I / II	II				
FARA TIMP DE PRELUARE: Conform UNE-EN 13197:2012+A1:2014		Clasa (T)	Nu se aplica.				

Data inceperii testului	30.01.2017	Data terminarii testului	24.02.2017
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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> AETEC SA D. Francisco J. Guerra	Referinta document I-7-MC (E) Rev. 9 Pag. 1 din 2
	4099/PE-RR-II	18 aprilie 2017		

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

Situatia valabilitatii certificatului poate fi confirmata pe www.aetec.es

Manolescu Shippa Elena
Traducator Autorizat
Engleza-Franceza
Autorizatie nr 8446

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. 14°C HR: 48%
 Temp. material (termoplastic) $^{\circ}\text{C}$: 200
 Materiale aplicate, % deviere la cerere: Material Peliculogen: -1,30 Microbile 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): $0^{\circ} \pm 20^{\circ}$
 Unghi de virare (grade): alternativ $+1^{\circ}(\pm 10^{\circ}) / -1^{\circ}(\pm 10^{\circ})$
 Temperatura ambianta: intre $+5^{\circ}\text{C}$ y $+10^{\circ}\text{C}$
 Ciclu de actionare: In conformitate cu UNE-EN 13197:2012+A1:2014

Mambrescu Simona Elena
 Traducator Autorizat
 Engleza - Franceza
 Autorizatie nr 8446

Periodicitatea masuratorilor: 0.01; 0.1; 0.2; 0.5; 1.0; 2.0; 3.0 si 4.0×10^6 treceri roata

Abateri: --

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 $\times 10^6$
Vizibilitate pe timp de noapte in conditiile: $(\text{med m}^{-2} \cdot \text{lx}^{-1})$	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
	Q_d $(\text{med m}^{-2} \cdot \text{lx}^{-1})$	$Q2(100)^1 - Q1(80)^2$	P5	1.0

Rezistența la derapare	SRT	Sl(45)	P6	2.0
1) Pentru culoarea alba			P7	4.0
2) Pentru culoarea galbena				

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 (med-m-1x)	Uscat	412	419	430	410	342	273	237	232	±7%
	Ploaie	67	56	44	44	36	29	30	31	±8%
	Umed	258	182	144	134	129	95	88	83	±8%
Vizibilitate pe timpul zilei	x	0.325	0.327	0.329	0.330	0.333	0.334	0.336	0.338	±0.004
	y	0.345	0.347	0.350	0.350	0.353	0.354	0.355	0.358	±0.005
	β	0.704	0.690	0.685	0.684	0.667	0.660	0.663	0.652	±0.016
	Qd (med-m ⁻² ·lx ⁻¹)	245	230	235	237	232	239	241	237	±8%
Rezistența la derapare	SRT	56	53	50	49	45	48	46	45	±5
	(temp. apei folo- ta la test) (°C)	11	12	12	12	11	10	12	13	±0.2
Procentul de uzura (marcaj ru- tier ramas)	%	100	100	100	100	100	100	100	100	±5%

Manolescu Simona Flavia
Traducător
Engleza - Franceza
Autentificat de autor

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.

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 supra-fetei drumului, conditii meteorologice, etc.), precum si de conditiile de aplicare.

CERTIFICAT DE TEST DE DURABILITATE Acest certificat este identic cu versiunea originala spaniola	Ref. 4099/PE-RR-II	Data eliberarii 18 aprilie 2017	Director Laborator. <i>Semnatura indescifrabila</i> <i>Stampila rotunda legala a</i> AETEC SA D. Francisco J. Guerra	Referinta document I-7-MC (E) Rev. 9 Pag. 2 din 2
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Acest CERTIFICAT nu poate fi reprodus partial fara permisiunea AETEC S.A.

Subsemnata **MANOLESCU SIMONA-ELENA**, interpret si traducator autorizat pentru Limbile: Engleza in temeiul autorizatiei nr. 8446 din data de 30/01/2003 si Spaniola in temeiul autorizatiei nr. 10183 din data de 26/09/2003, eliberate de Ministerul Justitiei din Romania, certific exactitatea traducerii efectuate din limbile Engleza si Spaniola in limba Romana, ca textul prezentat a fost tradus complet, fara omisiuni, si ca, prin traducere, inscrisului nu i-au fost denaturate continutul si sensul.

Inscrisul a carui traducere se solicita in intregime are, in integralitatea sa, un numar de 2 pagini, poarta titlul/denumirea de **CERTIFICAT DE TEST DE DURABILITATE**, a fost emis de **a e t e c**, si mi-a fost prezentat mie in intregime.

INTERPRET SI TRADUCATOR AUTORIZAT
MANOLESCU SIMONA-ELENA