aetec

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

Quality control:
· Durability test for road marking materials
· Road marking, perfomance in use

ilac-MRA ENAC ENSAYOS Nº 877/LE1781

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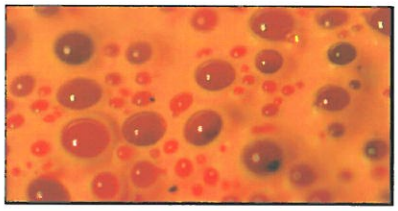
ROAD MARKING MATERIALS

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

CERTIFICATE OF DURABILITY TEST — REF. 3472/P-R-I

Client: **NIRLAT Ltd.**
Kibbutz Nir-Oz 8512200
ISRAEL

Issue date: **June 23th, 2015**



1.- TESTED ROAD MARKING SYSTEM

A) IDENTIFICATION

MATERIALS IDENTIFICATION, TRADE MARK NAME AND TYPE OF APPLICATION		MANUFACTURER(S)	Thickness (µm)	Dossage (g/m²)
Nature:	Yellow acrylic paint			
Trade mark[1]:	**FORMULA 1 Yellow**	**NIRLAT Ltd.**	**x**	**750**
Applied by:	Spray			
Nature:	Glass beads			
Trade mark[2]:	**ECHOSTAR 5 SBP**	**SOVITEC**		**400**
Applied by:	Drop-on			
TYPE OF MATERIAL:	Yellow 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 autorization.

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 necesaries			Expressed in	P0	P4	P5	P6	P7
Night-time visibility	Coefficient of retro reflected luminance R_L	dry	Class (R)	R1	R4	R4	R4	R1
Day-time visibility	Luminance coeficient in diffuse illumination Qd		Class (Q)	Q3	Q3	Q3	Q3	Q3
	or luminance factor ß		Class (B)	B3	B3	B3	B3	B2
	Chromatcity coordinates (x,y)		Pass / Not Pass	pass	pass	pass	pass	pass
Skid resistence	SRT units		Class (S)	S1	S1	S2	S2	S2
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:	May 11th, 2015	Date of end the test:	June 02nd, 2015

CERTIFICATE OF DURABILITY TEST	Ref.	Issue date	Technical Director	Document reference
This certificate is identical to the original spanish version.	3472/P-R-I	June 23th, 2015	D. David Calavia	I-7-MC Rev. 9 Page 1 of 2

The validity status of the certificate can be confirmed in www.aetec.es

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:	20°C	HR:	36%	Material temperature (thermoplastic) °C:		x	
Materials applied, % desviation on requested:	Film maker material:	-4,00	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							
Dryving 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

CARACTERISTIC		TECHINCAL CLASSES AND MINIMUM VALUES
Night-time visibility under conditions: ($mcd \cdot m^{-2} \cdot lx^{-1}$)	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 ($mcd \cdot m^{-2} \cdot lx^{-1}$)	Q2 (100)[1] - Q1 (80)[2]
Skid resistance	SRT	S1 (45)

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

TRAFFIC CLASSES AND REQUIRED Nº OF ROLL-OVERS
in accordance to UNE-EN 13197:2012+A1:2014

TRAFFIC CLASS	Nº 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 techical classes

in accordance to 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 ($mcd \cdot m^{-2} \cdot lx^{-1}$)	dry	129	204	211	215	204	210	121	126	± 9 %
Day-time visibility	x	0,470	0,470	0,470	0,469	0,469	0,469	0,464	0,462	± 0,003
	y	0,460	0,461	0,460	0,460	0,460	0,462	0,461	0,461	± 0,003
	β	0,426	0,425	0,421	0,423	0,421	0,409	0,374	0,358	± 0,019
	Qd ($mcd \cdot m^{-2} \cdot lx^{-1}$)	239	185	190	188	178	174	153	151	± 7 %
Skid resistance	SRT	48	50	49	47	52	50	52	52	± 5
	Temperature water used in the test (°C)	20	20	20	20	19	18	20	21	± 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 retrorreflective properties of the road marking assembly:

- **R** For a road marking assembly retrorreflective under dry conditions.
- **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.
- **NR** For a road marking assembly not retrorreflective.

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.