

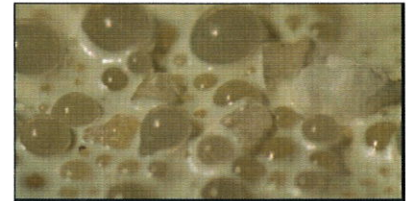
## ROAD MARKING MATERIALS

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

<b>CERTIFICATE OF DURABILITY TEST</b>	REF.	<b>3608/P7-R-I</b>
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**Client:** METALBAC & FARBE SA  
 DN 11, Magura, Bacau  
 ROMANIA Zip Code: 607305

**Issue date:** December 21th, 2015



### 1.- TESTED ROAD MARKING SYSTEM

#### A) IDENTIFICATION

MATERIALS IDENTIFICATION, TRADE MARK NAME AND TYPE OF APPLICATION		MANUFACTURER(S)	Thickness (µm)	Dosage (g/m <sup>2</sup> )
Nature:	White preformed thermoplastic	<b>METALBAC &amp; FARBE SA</b>	<b>3.000</b>	<b>x</b>
Trade mark <sup>1</sup> :	<b>PREFORM TCG.1</b>			
Applied by:	Applied flame	<b>SOVITEC</b>		<b>450</b>
Nature:	Glass beads			
Trade mark <sup>2</sup> :	<b>ECHOSTAR 10 TRM SRT KOR</b>			
Applied by:	Drop-on			
<b>TYPE OF MATERIAL:</b> White preformed thermoplastic road marking with premix and drop-on (prebeaded) glass beads and an additional amount of drop-on glass beads to be applied by heat.				
<b>CHARACTERISTIC OF THE ROAD MARKING:</b> (in accordance to UNE-EN 1436:2009+A1:2009)			<b>Not structured</b>	



- 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 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	<b>P0</b>	<b>P4</b>	<b>P5</b>	<b>P6</b>	<b>P7</b>
Night-time visibility	Coefficient of retro reflected luminance R <sub>L</sub>	dry	Class (R)	<b>R5</b>	<b>R4</b>	<b>R4</b>	<b>R4</b>	<b>R4</b>
Day-time visibility	Luminance coefficient in diffuse illumination Q <sub>d</sub>		Class (Q)	<b>Q5</b>	<b>Q4</b>	<b>Q4</b>	<b>Q4</b>	<b>Q4</b>
	or luminance factor B		Class (B)	<b>B5</b>	<b>B4</b>	<b>B4</b>	<b>B3</b>	<b>B3</b>
	Chromaticity coordinates (x,y)		Pass / Not Pass	<b>pass</b>	<b>pass</b>	<b>pass</b>	<b>pass</b>	<b>pass</b>
Skid resistance	SRT units		Class (S)	<b>S4</b>	<b>S2</b>	<b>S3</b>	<b>S2</b>	<b>S2</b>
Type	Type road marking system		Type I / II	<b>I</b>				
<b>NO PICKUP-TIME:</b> In accordance with UNE-EN 13197:2012+A1:2014			Class (T)	<b>x</b>				

Date of start of the test: **November 09th, 2015**      Date of end the test: **November 30th, 2015**

<b>CERTIFICATE OF DURABILITY TEST</b>	Ref.	Issue date	Technical Director	Document reference
This certificate is identical to the original spanish version.	<b>3608/P7-R-I</b>	<b>December 21th, 2015</b>		
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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 <sup>o</sup> amb: 19°C	HR:	61%	Material temperature (thermoplastic) °C:	x	
Materials applied, % deviation on requested:	Film maker material:	x	Glass beads:	0,00	Others materials:	x
	Antiskid aggregates:	x	Mixture:	x	Premix:	x
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 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 <sup>6</sup> wheel passages					
Deviations:						

## 3.- PASS/FAIL CRITERIA:

PERFORMANCE REQUIREMENTS OF THE ROAD MARKING ASSEMBLY in accordance to UNE-EN 1436:2009+A1:2009		
CARACTERISTIC		TECHNICAL CLASSES AND MINIMUM VALUES
Night-time visibility under conditions: (mcd·m <sup>-2</sup> ·lx <sup>-1</sup> )	R <sub>L</sub> DRY	R2 (100) <sup>1</sup> - R1 (80) <sup>2</sup>
	R <sub>L</sub> RAIN	RR1 (25)
	R <sub>L</sub> WET	RW1 (25)
Day-time visibility	(x,y)	inside the relevant polygon
	β	B2 (0,3) <sup>1</sup> - B1 (0,2) <sup>2</sup>
	Qd (mcd·m <sup>-2</sup> ·lx <sup>-1</sup> )	Q2 (100) <sup>1</sup> - Q1 (80) <sup>2</sup>
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 <sup>6</sup>
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 to UNE-EN 1436:2009+A1:2009

CARACTERISTIC		value and for each number of roll-overs x 10 <sup>6</sup>								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	dry	383	351	331	283	273	253	234	234	± 9 %
Day-time visibility	x	0,326	0,328	0,329	0,328	0,330	0,332	0,332	0,334	± 0,003
	y	0,346	0,347	0,347	0,346	0,348	0,350	0,351	0,353	± 0,003
	β	0,690	0,609	0,552	0,511	0,510	0,465	0,507	0,492	± 0,019
	Qd (mcd·m <sup>-2</sup> ·lx <sup>-1</sup> )	258	225	207	190	179	175	184	189	± 7 %
Skid resistance	SRT	60	56	56	54	55	51	53	52	± 5
	Temperature water used in the test (°C)	16	16	15	15	14	15	11	11	± 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.

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