

ROAD MARKING MATERIALS

(Durability against abrasion: UNE-EN 13197: 2012)

CERTIFICATE OF DURABILITY TEST

REF.

3240/P-R-I

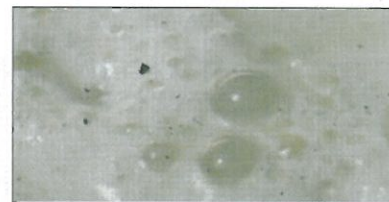
Client:

PINTURAS TERMOPLÁSTICAS DEL SUR S.L.

Avda. las Americas 9, 2º Izda
15172 PERILLO - La Coruña - ESPAÑA

Issue date:

October 17th, 2014



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 preformed thermoplastic | PINTURAS TERMOPLÁSTICAS DEL SUR S.L. | 2.600 | 5.700 |
| Trade mark ¹ : | THERMOMARK | | | |
| Applied by: | Applied flame | | | |
| TYPE OF MATERIAL: White preformed thermoplastic road marking with premix and drop-on (prebeaded) glass beads to be applied by heat. | | | | |
| CHARACTERISTIC OF THE ROAD MARKING: (in accordance to UNEEN 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

>0,90 y ≤1,20 mm.

RG3

| 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 | | | | | |
|--|---|-----|-----------------|---|------|------|------|------|----|
| 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) | R2 | R4 | R5 | R5 | R5 | |
| 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 | B4 | B4 | |
| | Chromaticity coordinates (x,y) | | Pass / Not Pass | pass | pass | pass | pass | pass | |
| Skid resistance | SRT units | | Class (S) | S1 | S2 | S2 | S1 | S1 | |
| Type | Type road marking system | | Type I / II | I | | | | | |
| NO PICKUP-TIME: In accordance with UNE-EN 13197: 2012 | | | Class (T) | no determ. | | | | | |

Date of start of the test:

August 12th, 2014

Date of end the test:

October 13th, 2014

| CERTIFICATE OF DURABILITY TEST | Ref. | Issue date | Technical Director | Document reference |
|--|------------|--------------------|--------------------|---|
| This certificate is identical to the original spanish version. | 3240/P-R-I | October 17th, 2014 | D. David Catavia | 1-7-MC C/ Isaac Peral, 1 28914 LEGANES Page 1 of 1 |

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2.- TEST CONDITIONS:

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

| | | | | | |
|--|---|----------------|--|-------|---|
| Test plates: | 1 | Roughness: | RG3 | Size: | G |
| Conditions during application: | t° amb: 29°C | HR: 34% | Material temperature (thermoplastic) °C: | x | x |
| Materials applied, % deviation on requested: | Film maker material: 0,00 | Glass beads: x | Others materials: | x | x |
| | Antiskid aggregates: x | Mixture: x | Premix: | x | 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 | | | | |
| 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 | | 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 to UNE-EN 13197: 2012 | |
|--|---------------------------------|
| 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 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 | dry | 121 | 211 | 248 | 282 | 303 | 336 | 316 | 308 | ± 8 % |
| Day-time visibility | x | 0,327 | 0,328 | 0,330 | 0,333 | 0,333 | 0,333 | 0,331 | 0,332 | ± 0,003 |
| | y | 0,347 | 0,349 | 0,349 | 0,353 | 0,353 | 0,353 | 0,350 | 0,351 | ± 0,003 |
| | β | 0,758 | 0,710 | 0,675 | 0,637 | 0,605 | 0,585 | 0,530 | 0,515 | ± 0,015 |
| | Qd (mcd·m ⁻² ·lx ⁻¹) | 270 | 249 | 239 | 233 | 231 | 223 | 215 | 213 | ± 10 % |
| Skid resistance | SRT | 47 | 53 | 51 | 51 | 50 | 48 | 45 | 45 | ± 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.

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