

**SWARCO LIMBURGER LACKFABRICK GmbH**

**ROLLER PLASTIC RP 15**

**REPORT NUMBER: EXP 2588/18-3574 A1**

**LABORATORY REPORT  
ROAD MARKING**

REPORT	:	2588/18-3574 A1
CUSTOMER	:	SWARCO LIMBURGER LACKFABRIK GmbH
ADDRESS	:	Robert-Bosch-StraBe 17 D-65582 Diez, Deutschland
TEST DATES	:	From 16/05/2018 to 4/06/2018
TEST REQUESTED	:	EN 1871:00 and UEN EN ISO 868:03
DATE REPORT	:	11/06/2018

PRODUCT	:	Roller Plastic RP 15 for bicycle lanes White RAL 9016 MR (100:1) Batch: 20181034
MANUFACTURER	:	SWARCO LIMBURGER LACKFABRIK <a href="http://www.swarco.com/limburgerlackfabrik">www.swarco.com/limburgerlackfabrik</a>
MATERIAL RECEIPT DATE	:	May 2018

AREA MANAGER:



Luis M. AMOR

LABORATORY DIRECTOR:



José Antonio HERGUETA

This report contains the presentation of the results obtained in the tests have been submitted materials or samples indicated therein. Unless otherwise stated, the samples have been selected and sent by the customer, so EUROCONSULT, SA liable only for the features tested by him, referring to the samples received, not the overall product, and the conclusions set out herein will not exceed, in any case, the scope and meaning that allow for such tests.

Results are considered as property of the applicant, and without authorization, EUROCONSULT, SA will not communicate to another party. EUROCONSULT, SA not responsible, in any case, the interpretation or misuse that may be made of this document, whose total or partial reproduction for advertising purposes is strictly forbidden. Publication is not permitted without the written consent of EUROCONSULT, SA, having reflected on it all the test results. The uncertainties in the trials are available to the client. Laboratories accredited by the Community of Madrid, according to RD Areas 1230/1989 HA-AP-AS-SE-ST-SV Date 05/17/1996.

NOTE: Shore hardness is outside the scope of ENAC accreditation

## **1.- BACKGROUND**

At the request of SWARCO LIMBURGER LACKFABRIKK GmbH and in order to verify the technical characteristics of the Roller Plastic RP 15 material, EUROCONSULT S.A. received the above material to come to the realization of the tests described in the Standard EN 1871:00 and UNE EN ISO 868:03.

The test methodology used and results are expressed in this report.

## **2.- TEST METHODOLOGY**

The determination of values for each test was carried out following the methods specified in the following Standards:

- Road marking materials. Road marking performance for road users..... EN 1436:2009
- Road marking materials. Physical properties.. ..... EN 1871:00
- Plastics. Methods of exposure to laboratory light sources. Part 3: UV lights UNE-EN ISO 4892-3:2016
- Plastics and ebonite. Determination of indentation hardness by means of a durometer (Shore hardness) ..... UNE EN ISO 868:03

### 3.- RESULTS

#### 3.1.- Colorimetry

##### 3.1.1.- Test Methodology:

The test is performed according to Annex A of the Standard EN 1871. Colorimetry is measured after seven days drying at  $23^{\circ}\text{C} \pm 2^{\circ}\text{C}$  and  $50\% \pm 5\%$  of relative humidity. Measures are determined on the upper surface.

Chromatic coordinates and luminance factor are determined with a spectrophotometer, using the illuminant D65, geometry  $45^{\circ}/0^{\circ}$  and standard observer of  $2^{\circ}$  according to Annex C of the Standard EN 1436.

##### 3.1.2.- Results:

Test	Result
Luminance factor	$\beta = 0.8586$
Chromatic coordinates	$x = 0.3204$
	$y = 0.3431$

#### 3.2.- Artificial accelerated ageing

##### 3.2.1.- Test methodology:

Two test pieces of aluminum are prepared (150 mm x 75 mm x 0.6 mm). A film of material is applied with a spreader suitable, they are maintained for 7 days in horizontal position at  $23^{\circ}\text{C} \pm 2^{\circ}\text{C}$  and  $50\% \pm 5\%$  of relative humidity. The color and the luminance factor are measured immediately before starting the test.

The test pieces are subjected to exposure to artificial accelerated ageing chamber, Q.U.V. Q-Panel Company(reference number: 176), according to Standard EN 1871 and to Standard ISO 4892-3, with cycles of 8 hours UV light at  $60^{\circ}\text{C} \pm 2^{\circ}\text{C}$  and 4 hours condensation at  $50^{\circ}\text{C} \pm 2^{\circ}\text{C}$  for 168 hours, under type II lamps (UVB-313).

##### 3.2.2.- Results:

Test	Result
Initial luminance factor	$\beta = 0.8577$
Final luminance factor	$\beta = 0.8489$
	$\Delta\beta = 0.0088$
Final Chromatic coordinates	$x = 0.3303$
	$y = 0.3538$

No surface defect is observed.

**3.3.- Shore hardness (\*)****3.3.1.- Test methodology:**

The test is performed according to Standard EN ISO 868. The thickness of the specimen was 6 mm. The temperature of the test was at 20°C.

**3.3.2.- Results:**

The result obtained was D/1:38 (The result is obtained with the average of 5 measures).

**SWARCO LIMBURGER LACKFABRIK GmbH**

**ROLLER PLASTIC RP 15**

**REPORT NUMBER: EXP 2588/18-3575**

**LABORATORY REPORT  
ROAD MARKING**

REPORT	:	2588/18-3575
CUSTOMER	:	SWARCO LIMBURGER LACKFABRIK GmbH
ADDRESS	:	Robert-Bosch-Straße 17 D-65582 Diez, Deutschland
TEST DATES	:	From 21/02/2018 to 27/03/2018
TEST REQUESTED	:	EN 1871:00 and UEN EN ISO 868:03
DATE REPORT	:	29/03/2018

PRODUCT	:	Roller Plastic RP 15 for bicycle lanes traffic yellow RAL 1023 MR(100:1). Batch: 20181035
MANUFACTURER	:	SWARCO LIMBURGER LACKFABRIK <a href="http://www.swarco.com/limburgerlackfabrik">www.swarco.com/limburgerlackfabrik</a>
MATERIAL RECEIPT DATE	:	19/02/2018

AREA MANAGER:



Luis M. AMOR

LABORATORY DIRECTOR:

  
  
an ECG Company

José Antonio HERGUETA

This report contains the presentation of the results obtained in the tests have been submitted materials or samples indicated therein. Unless otherwise stated, the samples have been selected and sent by the customer, so EUROCONSULT, SA liable only for the features tested by him, referring to the samples received, not the overall product, and the conclusions set out herein will not exceed, in any case, the scope and meaning that allow for such tests.

Results are considered as property of the applicant, and without authorization, EUROCONSULT, SA will not communicate to another party. EUROCONSULT, SA not responsible, in any case, the interpretation or misuse that may be made of this document, whose total or partial reproduction for advertising purposes is strictly forbidden. Publication is not permitted without the written consent of EUROCONSULT, SA, having reflected on it all the test results. The uncertainties in the trials are available to the client. Laboratories accredited by the Community of Madrid, according to RD Areas 1230/1989 HA-AP-AS-SE-ST-SV Date 05/17/1996.

NOTE: Shore hardness is outside the scope of ENAC accreditation

## **1.- BACKGROUND**

At the request of SWARCO LIMBURGER LACKFABRIKK GmbH and in order to verify the technical characteristics of the Roller Plastic RP 15 material, EUROCONSULT S.A. received the above material to come to the realization of the tests described in the Standard EN 1871:00 and UNE EN ISO 868:03.

The test methodology used and results are expressed in this report.

## **2.- TEST METHODOLOGY**

The determination of values for each test was carried out following the methods specified in the following Standards:

- Road marking materials. Road marking performance for road users..... EN 1436:2009
- Road marking materials. Physical properties.. ..... EN 1871:00
- Plastics. Methods of exposure to laboratory light sources. Part 3: UV lights UNE-EN ISO 4892-3:2016
- Plastics and ebonite. Determination of indentation hardness by means of a durometer (Shore hardness) ..... UNE EN ISO 868:03



**3.- RESULTS**

**3.1.- Colorimetry**

**3.1.1.- Test Methodology:**

The test is performed according to Annex A of the Standard EN 1871. Colorimetry is measured after seven days drying at 23°C ± 2°C and 50% ± 5% of relative humidity. Measures are determined on the upper surface.

Chromatic coordinates and luminance factor are determined with a spectrophotometer, using the illuminant D65, geometry 45°/0° and standard observer of 2° according to Annex C of the Standard EN 1436.

**3.1.2.- Results:**

Test	Result
Luminance factor	$\beta = 0.7064$
Chromatic coordinates	$x = 0.4565$
	$y = 0.4830$

**3.2.- Artificial accelerated ageing**

**3.2.1.- Test methodology:**

Two test pieces of aluminum are prepared (150 mm x 75 mm x 0.6 mm). A film of material is applied with a spreader suitable, they are maintained for 7 days in horizontal position at 23°C ± 2°C and 50% ± 5% of relative humidity. The color and the luminance factor are measured immediately before starting the test.

The test pieces are subjected to exposure to artificial accelerated ageing chamber, Q.U.V. Q-Panel Company(reference number: 176), according to Standard EN 1871 and to Standard ISO 4892-3, with cycles of 8 hours UV light at 60 °C ± 2 °C and 4 hours condensation at 50 °C ± 2°C for 168 hours, under type II lamps (UVB-313).

**3.2.2.- Results:**

Test	Result
Initial luminance factor	$\beta = 0.7069$
Final luminance factor	$\beta = 0.7044$
	$\Delta\beta = 0.0025$
Final Chromatic coordinates	$x = 0.4555$
	$y = 0.4804$

No surface defect is observed.

**3.3.- Shore hardness (\*)****3.3.1.- Test methodology:**

The test is performed according to Standard EN ISO 868. The thickness of the specimen was 6 mm. The temperature of the test was at 20°C.

**3.3.2.- Results:**

The result obtained was D/1:37 (The result is obtained with the average of 5 measures).

**SWARCO LIMBURGER LACKFABRIK GmbH**

**ROLLER PLASTIC RP 15**

**REPORT NUMBER: EXP 2588/18-3576**

**LABORATORY REPORT  
ROAD MARKING**

REPORT	:	2588/18-3576
CUSTOMER	:	SWARCO LIMBURGER LACKFABRIK GmbH
ADDRESS	:	Robert-Bosch-StraBe 17 D-65582 Diez, Deutschland
TEST DATES	:	From 21/02/2018 to 27/03/2018
TEST REQUESTED	:	EN 1871:00 and UEN EN ISO 868:03
DATE REPORT	:	29/03/2018

PRODUCT	:	Roller Plastic RP 15 for bicycle lanes traffic orange RAL 2009 MR(100:1). Batch: 20181047
MANUFACTURER	:	SWARCO LIMBURGER LACKFABRIK <a href="http://www.swarco.com/limburgerlackfabrik">www.swarco.com/limburgerlackfabrik</a>
MATERIAL RECEIPT DATE	:	19/02/2018

AREA MANAGER:

  
Luis M. AMOR

LABORATORY DIRECTOR:

  
José Antonio HERGUETA

This report contains the presentation of the results obtained in the tests have been submitted materials or samples indicated therein. Unless otherwise stated, the samples have been selected and sent by the customer, so EUROCONSULT, SA liable only for the features tested by him, referring to the samples received, not the overall product, and the conclusions set out herein will not exceed, in any case, the scope and meaning that allow for such tests.

Results are considered as property of the applicant, and without authorization, EUROCONSULT, SA will not communicate to another party. EUROCONSULT, SA not responsible, in any case, the interpretation or misuse that may be made of this document, whose total or partial reproduction for advertising purposes is strictly forbidden. Publication is not permitted without the written consent of EUROCONSULT, SA, having reflected on it all the test results. The uncertainties in the trials are available to the client. Laboratories accredited by the Community of Madrid, according to RD Areas 1230/1989 HA-AP-AS-SE-ST-SV Date 05/17/1996.

NOTE: Shore hardness is outside the scope of ENAC accreditation

## 1.- BACKGROUND

At the request of SWARCO LIMBURGER LACKFABRIKK GmbH and in order to verify the technical characteristics of the Roller Plastic RP 15 material, EUROCONSULT S.A. received the above material to come to the realization of the tests described in the Standard EN 1871:00 and UNE EN ISO 868:03.

The test methodology used and results are expressed in this report.

## 2.- TEST METHODOLOGY

The determination of values for each test was carried out following the methods specified in the following Standards:

- Road marking materials. Road marking performance for road users..... EN 1436:2009
- Road marking materials. Physical properties.. ..... EN 1871:00
- Plastics. Methods of exposure to laboratory light sources. Part 3: UV lights UNE-EN ISO 4892-3:2016
- Plastics and ebonite. Determination of indentation hardness by means of a durometer (Shore hardness) ..... UNE EN ISO 868:03

### **3.- RESULTS**

#### **3.1.- Colorimetry**

##### **3.1.1.- Test Methodology:**

The test is performed according to Annex A of the Standard EN 1871. Colorimetry is measured after seven days drying at  $23^{\circ}\text{C} \pm 2^{\circ}\text{C}$  and  $50\% \pm 5\%$  of relative humidity. Measures are determined on the upper surface.

Chromatic coordinates and luminance factor are determined with a spectrophotometer, using the illuminant D65, geometry  $45^{\circ}/0^{\circ}$  and standard observer of  $2^{\circ}$  according to Annex C of the Standard EN 1436.

##### **3.1.2.- Results:**

<b>Test</b>	<b>Result</b>
Luminance factor	$\beta = 0.3630$
Chromatic coordinates	$x = 0.5472$
	$y = 0.3983$

#### **3.2.- Artificial accelerated ageing**

##### **3.2.1.- Test methodology:**

Two test pieces of aluminum are prepared (150 mm x 75 mm x 0.6 mm). A film of material is applied with a spreader suitable, they are maintained for 7 days in horizontal position at  $23^{\circ}\text{C} \pm 2^{\circ}\text{C}$  and  $50\% \pm 5\%$  of relative humidity. The color and the luminance factor are measured immediately before starting the test.

The test pieces are subjected to exposure to artificial accelerated ageing chamber, Q.U.V. Q-Panel Company (reference number: 176), according to Standard EN 1871 and to Standard ISO 4892-3, with cycles of 8 hours UV light at  $60^{\circ}\text{C} \pm 2^{\circ}\text{C}$  and 4 hours condensation at  $50^{\circ}\text{C} \pm 2^{\circ}\text{C}$  for 168 hours, under type II lamps (UVB-313).

##### **3.2.2.- Results:**

<b>Test</b>	<b>Result</b>
Initial luminance factor	$\beta = 0.3640$
Final luminance factor	$\beta = 0.3683$
	$\Delta\beta = 0.0043$
Final Chromatic coordinates	$x = 0.5420$
	$y = 0.3986$

No surface defect is observed.

**3.3.- Shore hardness (\*)****3.3.1.- Test methodology:**

The test is performed according to Standard EN ISO 868. The thickness of the specimen was 6 mm. The temperature of the test was at 20°C.

**3.3.2.- Results:**

The result obtained was D/1:36 (The result is obtained with the average of 5 measures).

**SWARCO LIMBURGER LACKFABRICK GmbH**

**ROLLER PLASTIC RP 15**

**REPORT NUMBER: EXP 2588/18-3573**



<b>LABORATORY REPORT ROAD MARKING</b>
---

REPORT	:	2588/18-3573
CUSTOMER	:	SWARCO LIMBURGER LACKFABRIK GmbH
ADDRESS	:	Robert-Bosch-StraBe 17 D-65582 Diez, Deutschland
TEST DATES	:	From 21/02/2018 to 27/03/2018
TEST REQUESTED	:	EN 1871:00 and UEN EN ISO 868:03
DATE REPORT	:	29/03/2018

PRODUCT	:	Roller Plastic RP 15 for bicycle lanes traffic Red RAL 3020 MR(100:1). Batch: 20181036
MANUFACTURER	:	SWARCO LIMBURGER LACKFABRIK <a href="http://www.swarco.com/limburgerlackfabrik">www.swarco.com/limburgerlackfabrik</a>
MATERIAL RECEIPT DATE	:	19/02/2018

AREA MANAGER:



Luis M. AMOR

LABORATORY DIRECTOR:

  


José Antonio HERGUETA

This report contains the presentation of the results obtained in the tests have been submitted, materials or samples indicated therein. Unless otherwise stated, the samples have been selected and sent by the customer, so EUROCONSULT, SA liable only for the features tested by him, referring to the samples received, not the overall product, and the conclusions set out herein will not exceed, in any case, the scope and meaning that allow for such tests.

Results are considered as property of the applicant, and without authorization, EUROCONSULT, SA will not communicate to another party. EUROCONSULT, SA not responsible, in any case, the interpretation or misuse that may be made of this document, whose total or partial reproduction for advertising purposes is strictly forbidden. Publication is not permitted without the written consent of EUROCONSULT, SA, having reflected on it all the test results. The uncertainties in the trials are available to the client. Laboratories accredited by the Community of Madrid, according to RD Areas 1230/1989 HA-AP-AS-SE-ST-SV Date 05/17/1996.

NOTE: Shore hardness is outside the scope of ENAC accreditation

## **1.- BACKGROUND**

At the request of SWARCO LIMBURGER LACKFABRIK GmbH and in order to verify the technical characteristics of the Roller Plastic RP 15 material, EUROCONSULT S.A. received the above material to come to the realization of the tests described in the Standard EN 1871:00 and UNE EN ISO 868:03.

The test methodology used and results are expressed in this report.

## **2.- TEST METHODOLOGY**

The determination of values for each test was carried out following the methods specified in the following Standards:

- Road marking materials. Road marking performance for road users..... EN 1436:2009
- Road marking materials. Physical properties.. ..... EN 1871:00
- Plastics. Methods of exposure to laboratory light sources. Part 3: UV lights UNE-EN ISO 4892-3:2016
- Plastics and ebonite. Determination of indentation hardness by means of a durometer (Shore hardness)..... UNE EN ISO 868:03

### **3.- RESULTS**

#### **3.1.- Colorimetry**

##### **3.1.1.- Test Methodology:**

The test is performed according to Annex A of the Standard EN 1871. Colorimetry is measured after seven days drying at  $23^{\circ}\text{C} \pm 2^{\circ}\text{C}$  and  $50\% \pm 5\%$  of relative humidity. Measures are determined on the upper surface.

Chromatic coordinates and luminance factor are determined with a spectrophotometer, using the illuminant D65, geometry  $45^{\circ}/0^{\circ}$  and standard observer of  $2^{\circ}$  according to Annex C of the Standard EN 1436.

##### **3.1.2.- Results:**

<b>Test</b>	<b>Result</b>
Luminance factor	$\beta = 0.2214$
Chromatic coordinates	$x = 0.5867$
	$y = 0.3461$

#### **3.2.- Artificial accelerated ageing**

##### **3.2.1.- Test methodology:**

Two test pieces of aluminum are prepared (150 mm x 75 mm x 0.6 mm). A film of material is applied with a spreader suitable, they are maintained for 7 days in horizontal position at  $23^{\circ}\text{C} \pm 2^{\circ}\text{C}$  and  $50\% \pm 5\%$  of relative humidity. The color and the luminance factor are measured immediately before starting the test.

The test pieces are subjected to exposure to artificial accelerated ageing chamber, Q.U.V. Q-Panel Company(reference number: 176), according to Standard EN 1871 and to Standard ISO 4892-3, with cycles of 8 hours UV light at  $60^{\circ}\text{C} \pm 2^{\circ}\text{C}$  and 4 hours condensation at  $50^{\circ}\text{C} \pm 2^{\circ}\text{C}$  for 168 hours, under type II lamps (UVB-313).

##### **3.2.2.- Results:**

<b>Test</b>	<b>Result</b>
Initial luminance factor	$\beta = 0.2226$
Final luminance factor	$\beta = 0.2290$
	$\Delta\beta = 0.0064$
Final Chromatic coordinates	$x = 0.5889$
	$y = 0.3476$

No surface defect is observed.

**3.3.- Shore hardness (\*)****3.3.1.- Test methodology:**

The test is performed according to Standard EN ISO 868. The thickness of the specimen was 6 mm. The temperature of the test was at 20°C.

**3.3.2.- Results:**

The result obtained was D/1:37 (The result is obtained with the average of 5 measures).

**SWARCO LIMBURGER LACKFABRICK GmbH**

**ROLLER PLASTIC RP 15**

**REPORT NUMBER: EXP 2588/18-3577**

**LABORATORY REPORT  
ROAD MARKING**

REPORT	:	2588/18-3577
CUSTOMER	:	SWARCO LIMBURGER LACKFABRIK GmbH
ADDRESS	:	Robert-Bosch-StraBe 17 D-65582 Diez, Deutschland
TEST DATES	:	From 24/05/2018 to 4/06/2018
TEST REQUESTED	:	EN 1871:00 and UEN EN ISO 868:03
DATE REPORT	:	11/06/2018

PRODUCT	:	Roller Plastic RP 15 for bicycle lanes traffic blue RAL 5012 MR(100:1). Batch: 20181048
MANUFACTURER	:	SWARCO LIMBURGER LACKFABRIK <a href="http://www.swarco.com/limburgerlackfabrik">www.swarco.com/limburgerlackfabrik</a>
MATERIAL RECEIPT DATE	:	May 2018

AREA MANAGER:



Luis M. AMOR

LABORATORY DIRECTOR:

  


José Antonio HERGUETA

This report contains the presentation of the results obtained in the tests have been submitted materials or samples indicated therein. Unless otherwise stated, the samples have been selected and sent by the customer, so EUROCONSULT, SA liable only for the features tested by him, referring to the samples received, not the overall product, and the conclusions set out herein will not exceed, in any case, the scope and meaning that allow for such tests.

Results are considered as property of the applicant, and without authorization, EUROCONSULT, SA will not communicate to another party. EUROCONSULT, SA not responsible, in any case, the interpretation or misuse that may be made of this document, whose total or partial reproduction for advertising purposes is strictly forbidden. Publication is not permitted without the written consent of EUROCONSULT, SA, having reflected on it all the test results. The uncertainties in the trials are available to the client. Laboratories accredited by the Community of Madrid, according to RD Areas 1230/1989 HA-AP-AS-SE-ST-SV Date 05/17/1996.

NOTE: Shore hardness is outside the scope of ENAC accreditation

## 1.- BACKGROUND

At the request of SWARCO LIMBURGER LACKFABRIKK GmbH and in order to verify the technical characteristics of the Roller Plastic RP 15 material, EUROCONSULT S.A. received the above material to come to the realization of the tests described in the Standard EN 1871:00 and UNE EN ISO 868:03.

The test methodology used and results are expressed in this report.

## 2.- TEST METHODOLOGY

The determination of values for each test was carried out following the methods specified in the following Standards:

- Road marking materials. Road marking performance for road users..... EN 1436:2009
- Road marking materials. Physical properties.. ..... EN 1871:00
- Plastics. Methods of exposure to laboratory light sources. Part 3: UV lights UNE-EN ISO 4892-3:2016
- Plastics and ebonite. Determination of indentation hardness by means of a durometer (Shore hardness) ..... UNE EN ISO 868:03

### **3.- RESULTS**

#### **3.1.- Colorimetry**

##### **3.1.1.- Test Methodology:**

The test is performed according to Annex A of the Standard EN 1871. Colorimetry is measured after seven days drying at  $23^{\circ}\text{C} \pm 2^{\circ}\text{C}$  and  $50\% \pm 5\%$  of relative humidity. Measures are determined on the upper surface.

Chromatic coordinates and luminance factor are determined with a spectrophotometer, using the illuminant D65, geometry  $45^{\circ}/0^{\circ}$  and standard observer of  $2^{\circ}$  according to Annex C of the Standard EN 1436.

##### **3.1.2.- Results:**

<b>Test</b>	<b>Result</b>
Luminance factor	$\beta = 0.2195$
Chromatic coordinates	$x = 0.2124$
	$y = 0.2440$

#### **3.2.- Artificial accelerated ageing**

##### **3.2.1.- Test methodology:**

Two test pieces of aluminum are prepared (150 mm x 75 mm x 0.6 mm). A film of material is applied with a spreader suitable, they are maintained for 7 days in horizontal position at  $23^{\circ}\text{C} \pm 2^{\circ}\text{C}$  and  $50\% \pm 5\%$  of relative humidity. The color and the luminance factor are measured immediately before starting the test.

The test pieces are subjected to exposure to artificial accelerated ageing chamber, Q.U.V. Q-Panel Company (reference number: 176), according to Standard EN 1871 and to Standard ISO 4892-3, with cycles of 8 hours UV light at  $60^{\circ}\text{C} \pm 2^{\circ}\text{C}$  and 4 hours condensation at  $50^{\circ}\text{C} \pm 2^{\circ}\text{C}$  for 168 hours, under type II lamps (UVB-313).

##### **3.2.2.- Results:**

<b>Test</b>	<b>Result</b>
Initial luminance factor	$\beta = 0.2213$
Final luminance factor	$\beta = 0.2302$
	$\Delta\beta = 0.0089$
Final Chromatic coordinates	$x = 0.2221$
	$y = 0.2388$

No surface defect is observed.



**3.3.- Shore hardness (\*)****3.3.1.- Test methodology:**

The test is performed according to Standard EN ISO 868. The thickness of the specimen was 6 mm. The temperature of the test was at 20°C.

**3.3.2.- Results:**

The result obtained was D/1:37 (The result is obtained with the average of 5 measures).

**SWARCO LIMBURGER LACKFABRICK GmbH**

**ROLLER PLASTIC RP 15**

**REPORT NUMBER: EXP 2588/18-3578**

**LABORATORY REPORT  
ROAD MARKING**

REPORT	:	2588/18-3578
CUSTOMER	:	SWARCO LIMBURGER LACKFABRIK GmbH
ADDRESS	:	Robert-Bosch-StraBe 17 D-65582 Diez, Deutschland
TEST DATES	:	From 21/02/2018 to 27/03/2018
TEST REQUESTED	:	EN 1871:00 and UEN EN ISO 868:03
DATE REPORT	:	29/03/2018

PRODUCT	:	Roller Plastic RP 15 for bicycle lanes traffic Green RAL 6024 MR(100:1). Batch: 20181049
MANUFACTURER	:	SWARCO LIMBURGER LACKFABRIK <a href="http://www.swarco.com/limburgerlackfabrik">www.swarco.com/limburgerlackfabrik</a>
MATERIAL RECEIPT DATE	:	19/02/2018

AREA MANAGER:



Luis M. AMOR

LABORATORY DIRECTOR:



José Antonio HERGUETA

This report contains the presentation of the results obtained in the tests have been submitted materials or samples indicated therein. Unless otherwise stated, the samples have been selected and sent by the customer, so EUROCONSULT, SA liable only for the features tested by him, referring to the samples received, not the overall product, and the conclusions set out herein will not exceed, in any case, the scope and meaning that allow for such tests.

Results are considered as property of the applicant, and without authorization, EUROCONSULT, SA will not communicate to another party. EUROCONSULT, SA not responsible, in any case, the interpretation or misuse that may be made of this document, whose total or partial reproduction for advertising purposes is strictly forbidden. Publication is not permitted without the written consent of EUROCONSULT, SA, having reflected on it all the test results. The uncertainties in the trials are available to the client. Laboratories accredited by the Community of Madrid, according to RD Areas 1230/1989 HA-AP-AS-SE-ST-SV Date 05/17/1996.

NOTE: Shore hardness is outside the scope of ENAC accreditation

## **1.- BACKGROUND**

At the request of SWARCO LIMBURGER LACKFABRIKK GmbH and in order to verify the technical characteristics of the Roller Plastic RP 15 material, EUROCONSULT S.A. received the above material to come to the realization of the tests described in the Standard EN 1871:00 and UNE EN ISO 868:03.

The test methodology used and results are expressed in this report.

## **2.- TEST METHODOLOGY**

The determination of values for each test was carried out following the methods specified in the following Standards:

- Road marking materials. Road marking performance for road users..... EN 1436:2009
- Road marking materials. Physical properties.. ..... EN 1871:00
- Plastics. Methods of exposure to laboratory light sources. Part 3: UV lights UNE-EN ISO 4892-3:2016
- Plastics and ebonite. Determination of indentation hardness by means of a durometer (Shore hardness) ..... UNE EN ISO 868:03

### **3.- RESULTS**

#### **3.1.- Colorimetry**

##### **3.1.1.- Test Methodology:**

The test is performed according to Annex A of the Standard EN 1871. Colorimetry is measured after seven days drying at  $23^{\circ}\text{C} \pm 2^{\circ}\text{C}$  and  $50\% \pm 5\%$  of relative humidity. Measures are determined on the upper surface.

Chromatic coordinates and luminance factor are determined with a spectroradiometer, using the illuminant D65, geometry  $45^{\circ}/0^{\circ}$  and standard observer of  $2^{\circ}$  according to Annex C of the Standard EN 1436.

##### **3.1.2.- Results:**

<b>Test</b>	<b>Result</b>
Luminance factor	$\beta = 0.2310$
Chromatic coordinates	$x = 0.3076$
	$y = 0.4932$

#### **3.2.- Artificial accelerated ageing**

##### **3.2.1.- Test methodology:**

Two test pieces of aluminum are prepared (150 mm x 75 mm x 0.6 mm). A film of material is applied with a spreader suitable, they are maintained for 7 days in horizontal position at  $23^{\circ}\text{C} \pm 2^{\circ}\text{C}$  and  $50\% \pm 5\%$  of relative humidity. The color and the luminance factor are measured immediately before starting the test.

The test pieces are subjected to exposure to artificial accelerated ageing chamber, Q.U.V. Q-Panel Company(reference number: 176), according to Standard EN 1871 and to Standard ISO 4892-3, with cycles of 8 hours UV light at  $60^{\circ}\text{C} \pm 2^{\circ}\text{C}$  and 4 hours condensation at  $50^{\circ}\text{C} \pm 2^{\circ}\text{C}$  for 168 hours, under type II lamps (UVB-313).

##### **3.2.2.- Results:**

<b>Test</b>	<b>Result</b>
Initial luminance factor	$\beta = 0.2278$
Final luminance factor	$\beta = 0.2342$
	$\Delta\beta = 0.0064$
Final Chromatic coordinates	$x = 0.3102$
	$y = 0.4844$

No surface defect is observed.

**3.3.- Shore hardness (\*)****3.3.1.- Test methodology:**

The test is performed according to Standard EN ISO 868. The thickness of the specimen was 6 mm. The temperature of the test was at 20°C.

**3.3.2.- Results:**

The result obtained was D/1:37 (The result is obtained with the average of 5 measures).