

# Consultancy Report

## BS 5609 (Section 2) Marine Immersion Testing

(Teslin - PL011705F)

Prepared for Premier Coatings and Converters

By Maggie Carnegie  
*Principal Consultant*  
*Technical Investigations Group*

23<sup>rd</sup> October 2015

Ref: 15-131127

***Commercial in confidence***

Smithers Pira  
Cleeve Road, Leatherhead  
Surrey KT22 7RU, United Kingdom  
Telephone: +44 (0) 1372 802000  
Fax: +44 (0) 1372 802245

*Registered number: 5761324 England*

**This report is made subject to the conditions that it is  
confidential and may not be disclosed in whole or in part to  
others without the written consent of Smithers Pira**



## 1 Introduction

Smithers Pira was asked by Premier Coatings and Converters to conduct testing on a self-adhesive label material to Section 2 of the Standard BS 5609: 1986, “Printed Pressure-Sensitive, Adhesive Coated Labels for Marine Use.”

Section 2 of the standard describes the marine and laboratory performance type tests for label base materials.

## 2 Samples received

*Table 1 – Details of sample received 4<sup>th</sup> June 2015*

Smithers Pira Ref	Product Description/ Product code	Base Substrate	Adhesive Code	Backing Paper
X1	Teslin PL011705F	175 $\mu$ Matt White Polyolefin	PCC17	87g Kraft Clay

## 3 Preparation of test plates

The test plates were prepared in accordance with Appendix B of the specification for all tests.

## 4 Preparation and application of base material

The materials were conditioned for at least 24 hours at  $23 \pm 2^\circ\text{C}$  and  $50 \pm 5\%$  rh before application to the test plates.

The materials were applied to the test plates in accordance with Appendix A of the specification.

After application, the test plates were conditioned for a further 48 hours at  $23 \pm 2^\circ\text{C}$  and  $50 \pm 5\%$  rh prior to commencement of the tests.

## **5 Marine performance type test (Clause reference: 4.1)**

The test plates were immersed in the sea for at least three months in accordance with Appendix C of the specification.

The test was carried out at Langstone Harbour near Hayling Island, Hampshire, England from July 2015 to October 2015.

Adhesion tests were conducted on the exposed samples as specified in Appendix D.

The requirement is an adhesion greater than 10.0 N/25mm (width).

## **6 Laboratory performance type tests (Clause reference: 4.2)**

### **6.1 Dimensional stability (4.2.1)**

The sections of material on the test plates were accurately measured in both the horizontal and vertical directions before being subjected to artificial weathering in accordance with Appendix E, which involves exposure to alternating cycles of salt spray and accelerated light ageing. The samples were then re-measured and any percentage increase or decrease in dimensions was determined.

### **6.2 Adhesion after 48 hours (4.2.2)**

The adhesion of the samples was measured 48 hours after application to the test plates.

Samples were tested in accordance with Appendix D.

The requirement is an adhesion greater than 12.5 N/25mm (width).

### **6.3 Adhesion after artificial weathering (4.2.3)**

Samples were artificially weathered in accordance with Appendix E which involves exposure to alternating cycles of salt spray and accelerated light.

The adhesion was then tested according to Appendix D.

The requirement is an adhesion greater than 12.5 N/25mm (width).

### **6.4 Adhesion after temperature cycling (4.2.4)**

The samples were tested in accordance with Appendix F.

The adhesion was measured according to Appendix D, after the samples have been exposed to 60°C for seven days followed immediately by two hours at 0°C.

The requirement is an adhesion greater than 12.5 N/25mm (width).

### **6.5 Colourfastness (4.2.5)**

Samples were artificially weathered in accordance with Appendix E which involves exposure to alternating cycles of salt spray and accelerated light.

The requirement is any change in colour should be no less than Grade 2 of the British Standard greyscale.

## 7 Results

7.1 **Table 2 – Adhesion tests on Teslin – PL011705F**

Test	Peel Force N/25mm				Pass/Fail
	Average	Range		Minimum Requirement	
		Min	Max		
<b>4.2.2 Adhesion after 48 hours</b>	13.58	13.47	13.74	12.5	Pass
<b>4.1 Adhesion after marine immersion</b>	24.70	23.35	26.01	10.0	Pass
<b>*4.2.3 Adhesion after artificial weathering</b>	-	-	-	12.5	Pass
<b>4.2.4 Adhesion after temperature cycling</b>	15.76	15.40	16.12	12.5	Pass

**\*Note:**

Unable to measure adhesion as the substrate broke on testing and could not be removed from the test plate.

7.2 **Table 3 – Dimensional stability tests (4.2.1)**

Sample ID	Average Expansion %			Pass/Fail
	Length	Width	Requirement	
Teslin – PL011705F	-0.24	0.24	-3 to 1	Pass

**7.3 Table 4 – Colourfastness (4.2.5)**

Sample ID	Grey Scale Rating	Requirement	Pass/Fail
Teslin – PL011705F	5	Any change in colour to be no less than grade 2	Pass

**8 Conclusion**

The Teslin – PL011705F material supplied by Premier Coatings and Converters conformed to all parts of BS 5609 Section 2 and a certificate is enclosed.

Prepared by



Maggie Carnegie  
Principal Consultant  
Technical Investigations

Checked by



Daniel Lansdowne  
Packaging Materials Technologist  
Technical Investigations

# TEST CERTIFICATE

## BS 5609 (Section Two)

**Client:** Premier Coatings and Converters  
**Product description:** Teslin – PL011705F  
**Base substrate:** 175 $\mu$  Matt White Polyolefin  
**Adhesive code:** PCC17  
**Backing paper:** 87g Kraft Clay  
**Smithers Pira Reference:** 15-131127

Tests passed	Test methods	Clause reference
Adhesion after marine immersion	C, D	4.1
Dimensional stability	E	4.2.1
Adhesion after 48 hours	D	4.2.2
Adhesion after artificial weathering	D, E	4.2.3
Adhesion after temperature cycle	D, F	4.2.4
Colourfastness	E, G	4.2.5

**This is to certify that the above label base material has been tested by Smithers Pira and conforms to BS 5609: 1986 Section 2 - 'Marine and Laboratory Performance of Label Base Materials'.**

**Signed:** .....  
  
Maggie Carnegie

**Dated:** 23<sup>rd</sup> October 2015