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## CONSULTANCY REPORT

**BS 5609 – Section 2**  
**(Self-adhesive label performance – Base material)**



**Prepared for: Shanghai Chasewit Technology Co., Ltd**

**By Annalise Martins**  
*Senior Technologist*  
*Print and Security*

*Issued: 29<sup>th</sup> May 2020*

**Reference: 19-156201**

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## 1 Introduction

Smithers was requested by Shanghai Chassewit Technology Co., Ltd to conduct testing on one self-adhesive label material to Section 2 of the Standard BS 5509:1986, "Printed Pressure-Sensitive, Adhesive Coated Labels for Marine Use".

Section 2 of the Standard covers the requirements of marine and laboratory performance for label base materials.

## 2 Samples received

*Table 1 – Details of samples received:*

Smithers Reference	Product Description	Base Substrate	Adhesive Code	Backing Paper
I1	CSH-19LBR	SYN	Emulsion Acrylic	SCK

## 3 Preparation of test plates

The test plates were prepared in accordance with Appendix B of the Standard 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 Standard.

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 Test methods and performance requirements

### 5.1 Marine performance type test (Standard 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 February 2020 to May 2020.

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).

### 5.2 Laboratory performance type tests

#### 5.2.1 Dimensional stability (Standard reference: 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.

#### 5.2.2 Adhesion after 48 hours (Standard reference: 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).

#### 5.2.3 Adhesion after artificial weathering (Standard reference: 4.2.3)

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

Samples were tested in accordance with Appendix D.

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

#### 5.2.4 Adhesion after temperature cycling (Standard reference: 4.2.4)

The samples were tested in accordance with Appendix F.

The adhesion was measured in accordance with Appendix D, after the samples have been exposed to 60°C for seven days followed immediately by two hours at 0° ± 2°C, 1 ± 2°C and ≤40%rh.

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

#### 5.2.5 Colourfastness (Standard reference: 4.2.5)

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

The requirement is any change in colour should be no less than grade 2 of the British Standard Grey Scale.

## 6 Results

### 6.1 Table 2 – Adhesion tests on self-adhesive materials

Test	Sample Reference	Peel Force N/25mm			Minimum Requirement	Pass/Fail
		Average	Range			
			Min	Max		
4.1 Adhesion after marine immersion	i1	23.58	22.97	23.94	10.0	Pass
4.2.2 Adhesion after 48 hours		17.19	16.92	17.52	12.5	Pass
4.2.3 Adhesion after artificial weathering		15.68*	15.59	15.76	12.5	Pass
4.2.4 Adhesion after temperature cycling		18.92	18.19	19.31	12.5	Pass

\*Average based on two replicates

### 6.2 Table 3 – Dimensional stability (4.2.1)

Sample ID	Average difference %			Pass/Fail
	Length	Width	Requirement	
i1	-0.38	-0.50	-3 to 1	Pass

5.3 Table 4 – Colourfastness (4.2.5)

Sample ID	Grey Scale Rating	Requirement	Pass/Fail
11	5	The colour of the label base material shall remain recognisable as the original hue and the grey scale rating will be no less than 2.	Pass

## 7 Conclusion

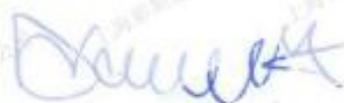
The 'CSH-19LBR' self-adhesive label material supplied by Shanghai Chasewill Technology Co., Ltd has met all the requirements of BS 5609 Section 2. A certificate is attached.

Prepared by



Annalise Martins  
Senior Technologist  
Print and Security

Checked by



David Tempest  
Senior Consultant  
Print and Security



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# TEST CERTIFICATE

## BS 5609 (Section Two)

**Client:** Shanghai Chasewit Technology Co., Ltd

**Product reference:** CSH-19LBR

**Base substrate:** SYN

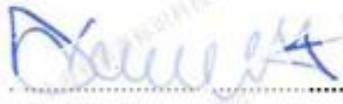
**Adhesive code:** Emulsion Acrylic

**Backing paper:** SCK

**Smithers Ref:** 15-156201

Tests passed	Standard reference
Adhesion after marine immersion	4.1
Dimensional stability	4.2.1
Adhesion after 48 hours	4.2.2
Adhesion after artificial weathering	4.2.3
Adhesion after temperature cycle	4.2.4
Colourfastness	4.2.5

This is to certify that the above label base material has been tested by Smithers and conforms to BS 5609:1986 Section 2 – Pressure-sensitive, adhesive-coated label base material.

**Signed:** 

David Tempest

**Dated:** 29<sup>th</sup> May 2020