

# Certificate of Test

Supplement to Certificate of Test number 9728 issued by Taylor Woodrow on 15<sup>th</sup> February 2001.

Since the original Certificate was issued, 'Akzo Nobel Decorative Coatings Ltd' has been renamed as 'Crown Paints Limited'.

Title:

**CROWN PAINTS LTD**

**Sandtex Trade High Build Textured  
Decorative Coating**

**Determination of Carbon Dioxide Diffusion  
Coefficient**

Certificate of Test No: 11339

Client's Name & Address:

**Crown Paints Ltd  
Crown House  
Hollins Road  
Darwen BB3 0BG**

Our Ref:	1.151.7
Job No:	T591-3LK6
Your Ref:	PO 4501031059
Date:	5 February 2009
Date Sample(s) Received:	19 December 2007
Sample(s) Received From:	Crown Paints

Sample No(s): 144478

Tested By:  D J Thompson

Authorised By:  S R Moxon

Job Title: **Manager, Testing & Contracting**

For

**Taylor Woodrow Technology**

Stanbridge Road, Leighton Buzzard, Bedfordshire,  
LU7 4QH  
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England



**TAYLOR  
WOODROW** 

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## 1. SAMPLE DESCRIPTION AND ANALYSIS REQUIRED

Taylor Woodrow Technology received one tin of Sandtex Trade High Build Textured Decorative Coating. The coating was given a unique Taylor Woodrow sample number (TW ref. 144478) for reference purposes only. No Certificate of sampling was received.

The Materials Testing Laboratories were requested to determine the carbon dioxide diffusion coefficient in accordance with our UKAS accredited In-House Test Procedure TP950/05/13569 Issue 1, which is in general accordance with EN 1062-6:2002.

## 2. METHOD

### 2.1 Coating Application

The coating system was brush applied to previously characterised unglazed ceramic tiles using a weighing procedure to achieve the coverage rate required. One coat of Sandtex High Build Textured Masonry Paint was applied, at a rate of 2500g/m<sup>2</sup>. The coated sample was allowed to cure for 2-3 days in the laboratory, and then conditioned at 23±2°C and 60±5% relative humidity for a minimum period of four weeks prior to testing.

### 2.2 Determination of Carbon Dioxide Diffusion Resistance\*

One coated tile (specimen no. 144478/3) was sealed in a circular steel rig such that the coated and uncoated faces were exposed. Carbon dioxide (15% in oxygen) at a known pressure and flow rate was passed over the coated face of the plate and helium gas was passed over the opposite face at the same pressure and flow rate. The helium gas stream was continuously monitored by gas chromatography to analyse for carbon dioxide. Equilibrium conditions were achieved after approximately 24 hours and the steady state flux of carbon dioxide was then calculated from the percentage of carbon dioxide in the helium stream and the flow rate of this gas.

The diffusion coefficient for carbon dioxide ( $D_{CO_2}$ ) is calculated using Fick's Law of Diffusion and Crank's equation.

\* In-House Test Procedure TP950/05/13569 Issue 1.

### 3. RESULTS

The results of the analysis are tabulated below.

#### CARBON DIOXIDE DIFFUSION RESISTANCE

Coating Name	<b>Sandtex Trade High Build Textured Decorative Coating</b>
TW Specimen No.	144478/3
$D_{CO_2}$ (cm <sup>2</sup> s <sup>-1</sup> )	5.21x10 <sup>-7</sup>
$\mu$ -value	2.86x10 <sup>+5</sup>
R (m)	442
Sc(cm)	110
Mean Dry Film Thickness ( $\mu$ m)	1544
Date of Test	05 February 2008

Notes:

- i) R (equivalent air layer thickness) and Sc (equivalent thickness of concrete) are dependent on the film thickness and are calculated here for the dry film thickness (DFT) present.
- ii)  $D_{CO_2}$  and the diffusion resistance coefficient ( $\mu$ -value) are calculated using the mean DFT measured on a spare unused specimen.
- iii)  $D_{CO_2}$  for an uncoated plate is  $1.0 \times 10^{-3} \text{ cm}^2\text{s}^{-1}$ .
- iv)  $S_c$  is calculated assuming an average grade concrete where the  $\mu$ -value has been estimated as 400.
- v) Klopfer criterion for effective anti-carbonation coating is R greater than 50 metres.
- vi) EN 1062-6 Classification C<sub>1</sub> for Carbon Dioxide Permeability requires the Sp value (R) to be greater than 50 metres.

**END OF CERTIFICATE**

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