Confidential Technical Report

Date: 25th November 2004

PROJECT NO: K1081

UV EXPOSURE OF SIMULATED BRICK MATERIAL

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POLYMER CLUSTER

For the attention of: Mr L Hunt

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UV Exposure of Simulated Brick

1. INTRODUCTION

Details of the samples supplied and the tests requested are as follows: -

Sample Designations:	1. Simulated Brick Materials
	2. Standard Brick
Description of Materials Received:	21 simulated brick test pieces nominally 80x320mm
	2 Standard Bricks
Date Received:	29th January 2004
Polymer Cluster Number:	K1081-032
Tests Requested:	UV exposure

2. LIMITATIONS

This report has been prepared solely based on information supplied up to the point of its completion and has been accepted in good faith.

The results relate only to the samples tested and to the particular tests carried out and cannot prove that the product material is generally fit for any intended purpose.

Unless a test is specifically stated to be included within the scope of our accreditation to ISO/IEC 17025, it should be assumed not to be so.
Reference to our standard UV light source limitation

Rapra does not have an independent facility for checking the spectral distribution of the lamps used in its artificial weathering machines. Therefore, it cannot formally assess conformity to standards that specify radiation energy levels at particular wavelengths. Reliance is placed on the manufacturer of the lamps supplying items that do conform to the requirements of any national/ international standards to which they are claimed to conform. The lamps are replaced at the recommended intervals specified by the manufacturer in order to keep within the claims made by the manufacturer.

3. EXPERIMENTAL DETAILS

The samples were tested in accordance with the following standards, except as otherwise noted.

Set up for Bricks

The two brick samples supplied were split in two, with one half of each brick being kept as a control reference test piece and were kept in dark conditions. The two-remaining halves were mounted into the test apparatus so that their weather face would be exposed to the weathering conditions.

Set up for simulated Bricks

Twenty of the supplied simulated brick test pieces were marked at half yearly intervals and fitted into the weathering apparatus. The one remaining test sample was kept as a control reference test piece as was kept under dark conditions.

UV Exposure Test

As detailed above the test pieces were mounted into a Q-panel weathering apparatus fitted with UVA 340 lamps. These lamps were chosen, as they are a close simulation to UV light on earth's surface. The apparatus was set to operate on a 4 hourly cycle, 4 hours UV followed by 4 hours condensation. The temperature during each cycle was set at 50°C. Testing was carried out in general accordance with ISO 4892-3:2000.

Tests pieces were removed from the cabinet at the equivalent of half yearly intervals up to a maximum of ten years and visual assessment of colour change was made using a Grey scale assessment chart.

Pictures of the equipment used and the exposed samples compared alongside the control samples are given in appendix A.

All test samples have been returned to L&R products for evaluation.

Ambient temperature was maintained at 23°C ± 2°C and all equipment used was calibrated to the accuracy required in the appropriate standard

4. RESULTS

(See Photographs – appendix A)

Photographs of the simulated bricks show the effect of U.V. light on samples tested (red bricks/3 shades). And should not be used to judge other simulated brick colours

Compare the control sample to samples; (Page 6) Years 1 to 5 – Little significant change is visible to the naked eye.

Compare the control samples; (page 7) Years 6 to 10 and by years 9/10 there is a visible difference. Fading is evident.

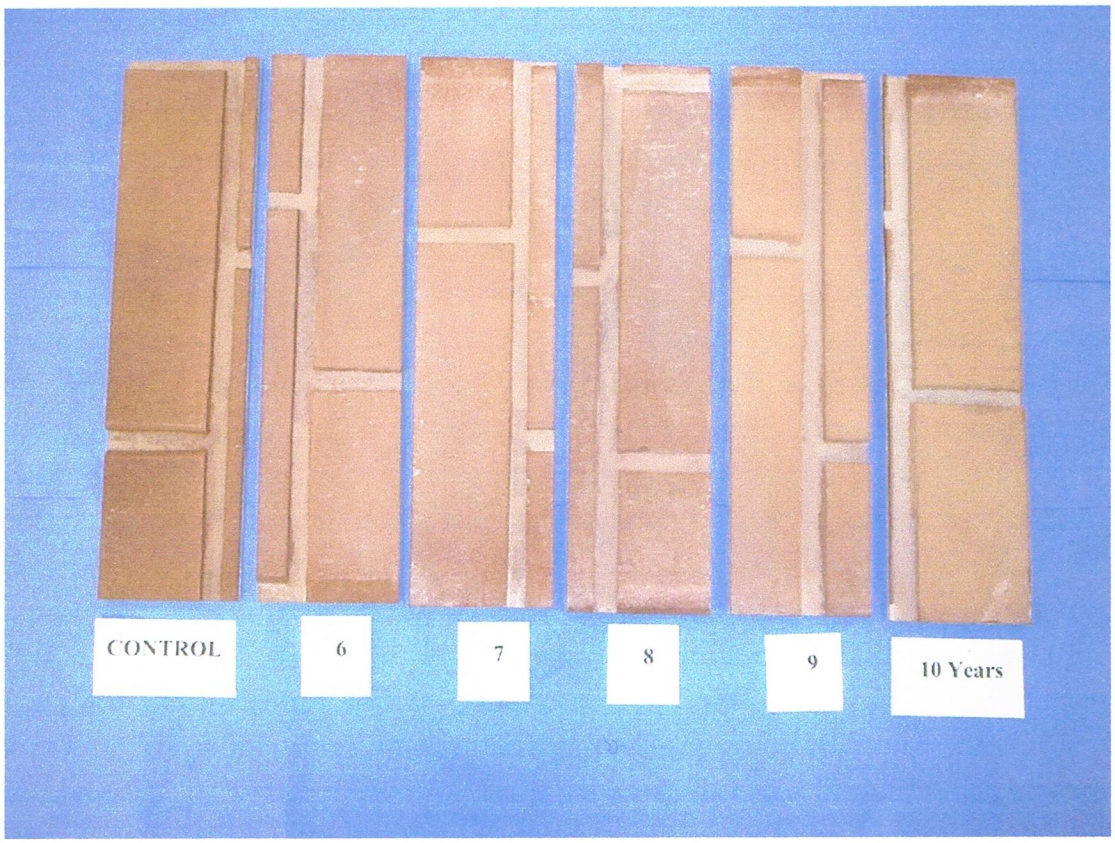
(tested samples returned for close up inspection and your reference)

5. DISCUSSION

Results obtained from testing of L&R brick patterns show, that after the equivalent of 5 years simulated weathering colour loss cannot barely be observed. After 10 years the colour change is however evident.

When considering the results which could be said to simulate a south facing aspect is should be noted, that, the samples selected from L&R prodct range were both small and of q dark reddish appearance giving what could be considered as a worst case scenario. It is therefore felt that L&R brick patterns are used in on site applications such as Dormers, Chimneys and Claddings in such locations and with the diversity if colours within the bricks it would be difficult to detect change with the human eye.

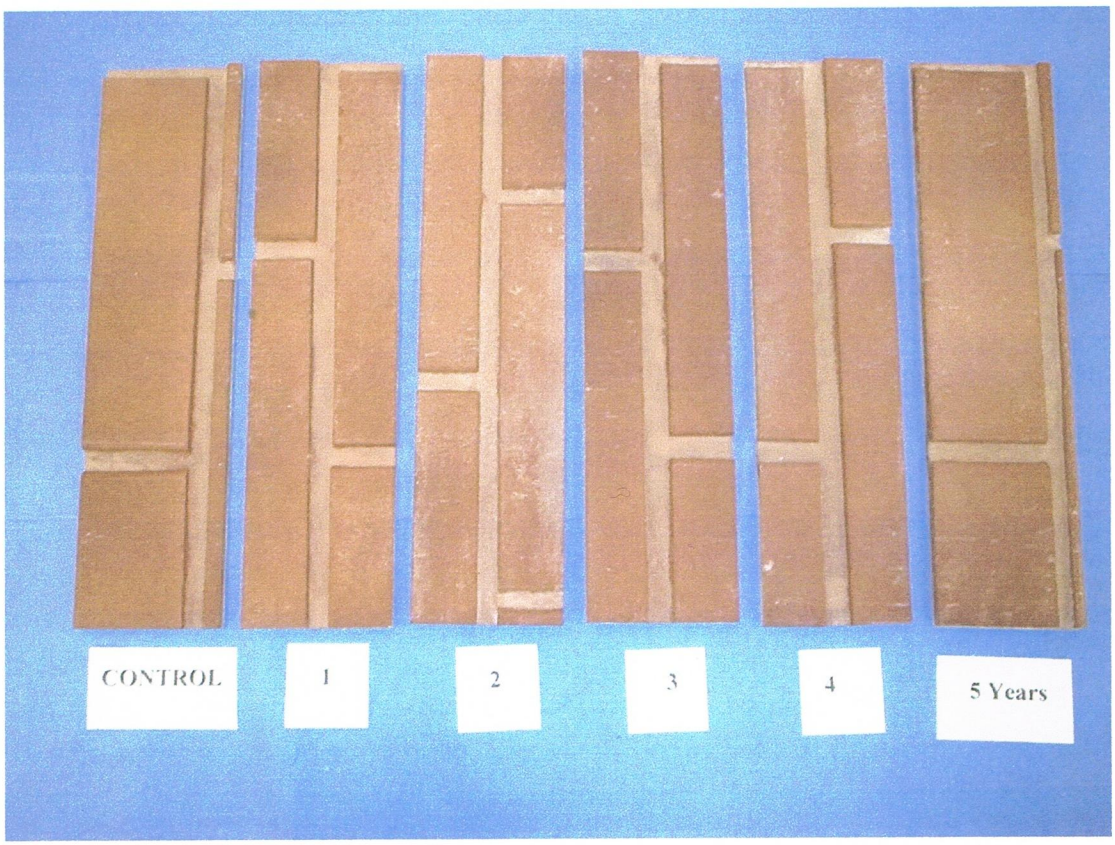
It should also be noted that in situ a general build up of atmospheric pollution would take place on the surface of the brick patterns, which may act as a U.V. inhibitor and cannot be accounted for during the test work carried out in this report. Reference to pollution is made on the United Nation Environmental website.



Control and Exposed Test Specimens

Brick Sample 1

Appendix A



Brick Sample 2

Q-Panel UV Exposure Cabinet