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BRITISH BOARD OF AGRÉMENT TEST REPORT No 44692 (Issue 2)

Determination of the change in heat flow through an uninsulated wall incorporating a *Radflek* sheet radiator reflector panel

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Summary

This report describes the determination of the change in heat flow arising from the use of a *Radflek sheet* reflective radiator panel inserted between a radiator and uninsulated walls.

The product reduced the heat flow by approximately 45% through the section of wall directly behind the radiator (approx 0.7m²).

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Date: 15 February 2010

Date: 15 February 2010

On behalf of the British Board of Agrément

Client: Lucid Thinking
King's Scholars House
230 Victoria Bridge Road
London SW1V 1AU

Job No: T144692 and T144897

Work period: June and August 2009

1 INTRODUCTION

This report describes the determination of the change in heat flow arising from the use of a *Radflek sheet* reflective radiator panel inserted between a radiator and an uninsulated wall.

2 SPECIMEN

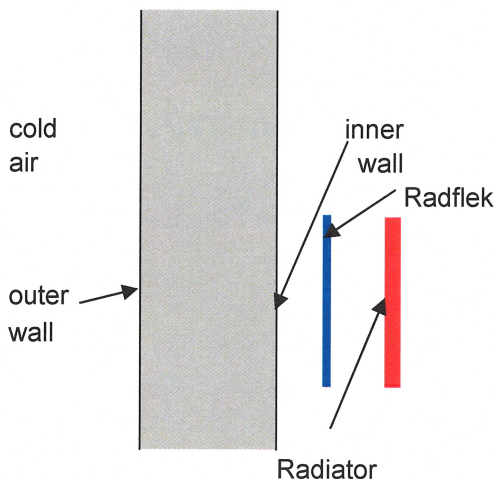
The specimen was supplied by the client and described as *Radflek sheet*, a radiator reflector panel, made from a coated reflective film laminated to both sides of a polyethylene core.

The specimen comprised a reflective sheet and slide on clips and was fitted by the BBA following the instruction leaflet provided by the Client.

3 APPARATUS

The apparatus comprised the cold box section of a guarded hot box apparatus, test walls of nominal U values $1.1 \text{ W/m}^2\text{K}$ and $2.2 \text{ W/m}^2\text{K}$ and an electric radiator as shown in figure 1. The surface temperatures were recorded with a measurement uncertainty estimated as $\pm 0.3\text{K}$ at a 95% confidence level.

Figure 1 Test arrangement



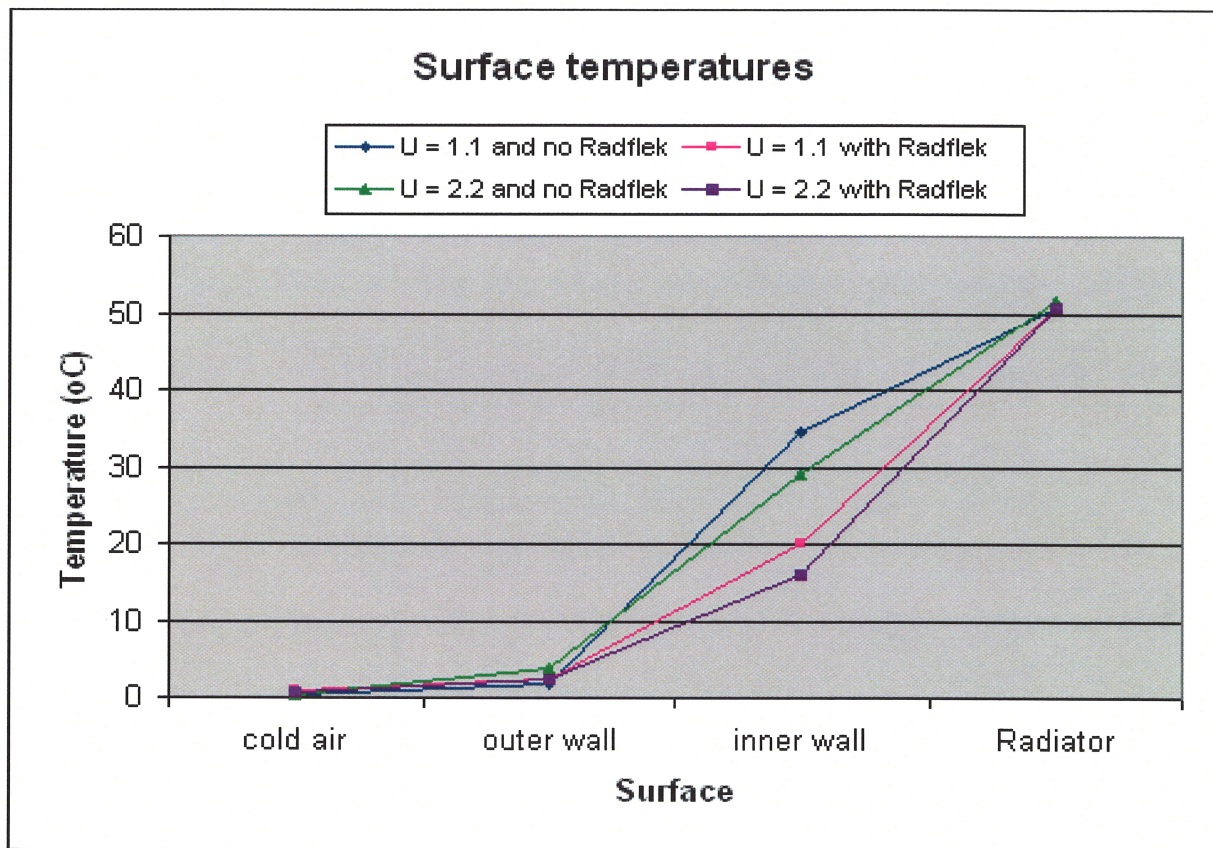
See Annex A for visual and a thermo graphic images of the test wall with a U value $\sim 1.1 \text{ W/m}^2\text{K}$ with and without the Radflek sheet in place.

4 MEASUREMENTS

Tests were carried out with and without the Radflek Sheet with the radiator ~80 mm from the wall. The surface temperatures were measured until they were stable and varying randomly for > 10 hours, see Table 1.

Table 1 *Surface temperatures (°C) measured under steady state conditions*

Wall U value (W/m ² K)	1.1	1.1	2.2	2.2
	No Radflek	Radflek	No Radflek	Radflek
cold air	0.2	1	0.2	0.5
outer wall	1.8	2.2	3.8	2.4
inner wall	34.5	19.9	29	15.9
Radiator	50.7	50.8	51.5	50.8



5 CALCULATIONS

The effect on heat flow through the wall can be calculated and standardised for a one degree temperature difference between the outdoor temperature and the radiator temperature. For the first test in Table 1:

Temperature difference across the wall	$34.5 - 1.8$	=	32.7°C
Thermal resistance of the wall	$1/(1.096 - 0.17)$	=	$0.742 \text{ m}^2\text{KW}$
Heat flow	$32.7 / 0.742$	=	44.07 W/m^2
Temperature difference, radiator to cold air	$50.7 - 0.2$	=	50.5K
Heat flow adjusted for a 1K temperature difference	$44.07 / 50.7$	=	0.872 W/m^2

Table 2 Heat flow rates for a 1K temperature difference (W/m^2)

	Wall U value (W/m^2K)	
	1.1	2.2
without Radflek	0.872	1.747
with Radflek	0.479	0.954
Difference	0.393	0.792
heat flow reduction %	45.1%	45.4%

6 CONCLUSIONS

The product has the effect of reducing the temperature seen by the wall and the relative independence of the reduction in heat flow from the walls U value is supportive of the adopted methodology.

The 45% reduction in heat flow through the part of the wall behind the radiator is appropriate for uninsulated walls, for example solid brick walls with U values $\sim 2.09 W/m^2K$ and insulated brick cavity walls with U values $\sim 1.55 W/m^2K$.

7 REPORT CONDITIONS

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7.3 Opinions and information in this Report are based on the BBA using due skill, care and diligence in its preparation and no explicit warranty is provided as to its accuracy.

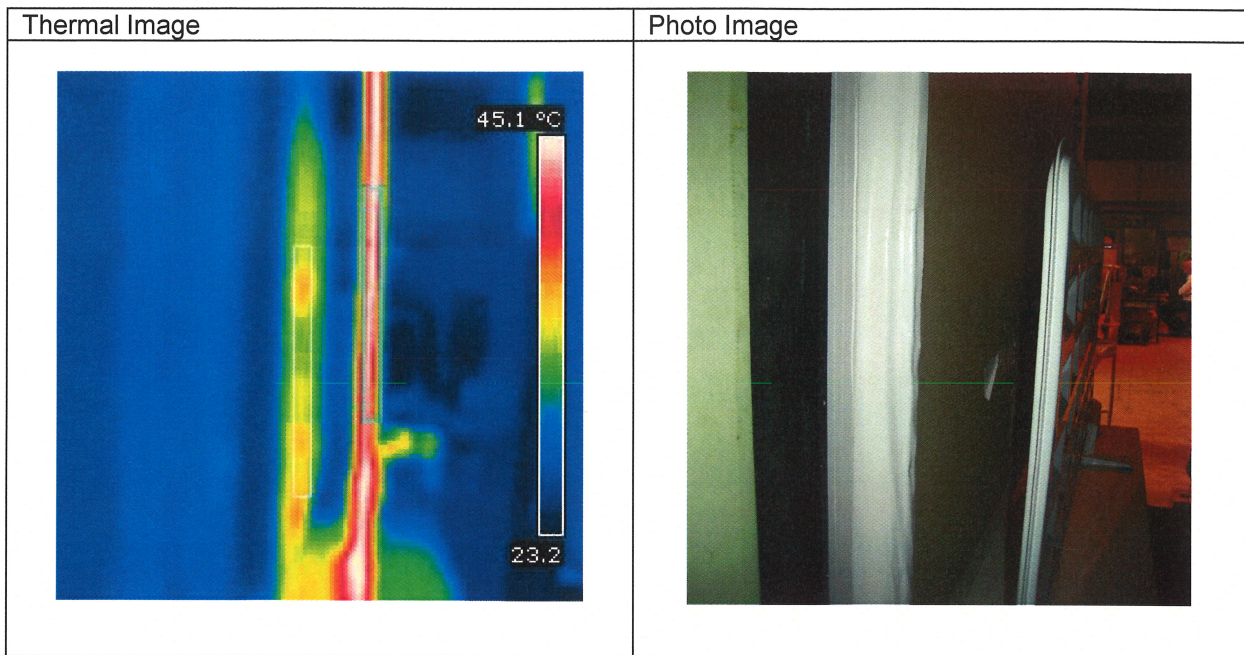
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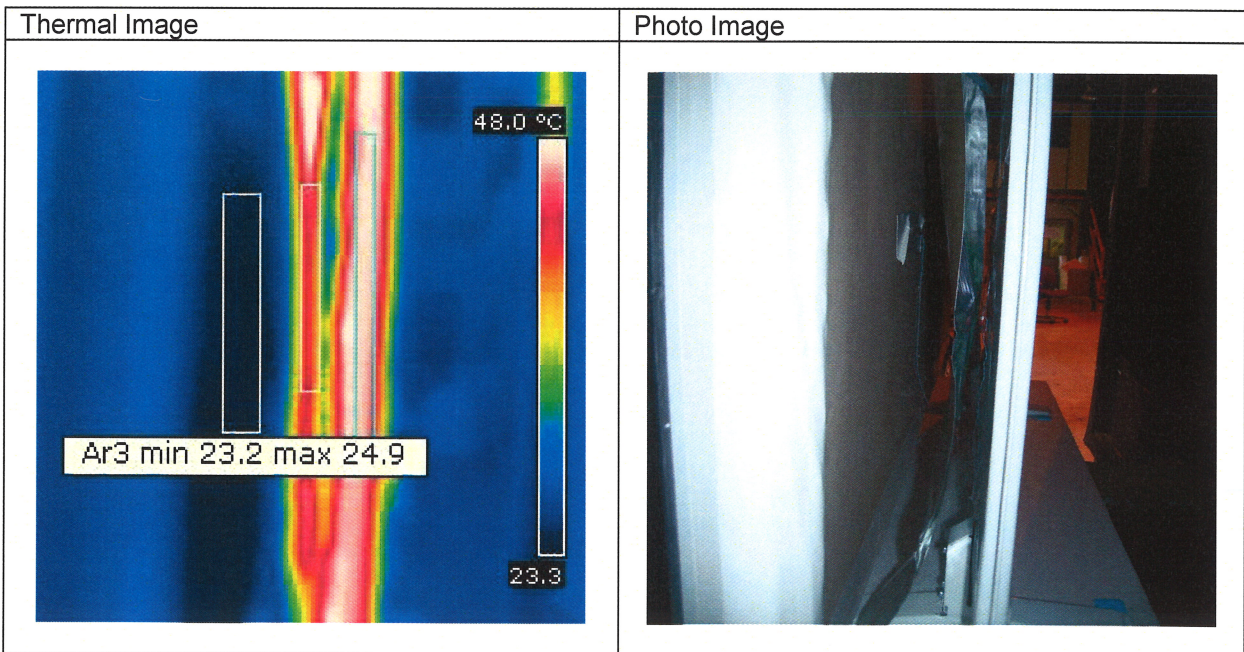
7.6 This Report does not constitute an approval, certification or endorsement of the product/system named on the front page.

Appendix A

Test wall U value $\sim 1.1 \text{ W/m}^2\text{K}$ without Radflek shield fitted



Test wall U value $\sim 1.1 \text{ W/m}^2\text{K}$ with Radflek Shield in place



The report is Issue 2 due to the product name being incorrect in Issue 1.

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