



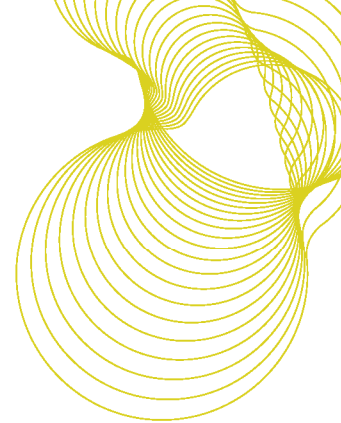
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**Air tightness tests on a
recessed Halers H2
downlight fitting for
ceiling fitting, from
Halers Lighting Ltd**

Prepared for: Mr. T. Allison
Haler Lighting Ltd

19 December 2011

Test report number 263670-2



Tested on behalf of BRE by

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Position Senior Consultant and Laboratory Manager, Actions, Building Technology Group
Date 17 June 2010

Signature *M. C. Pound*

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Approved on behalf of BRE

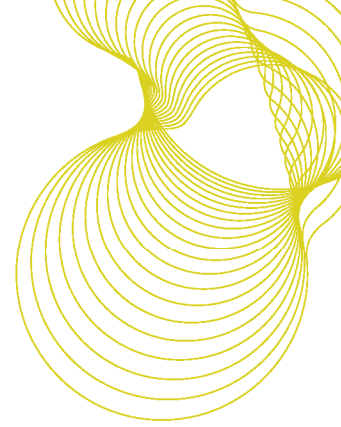
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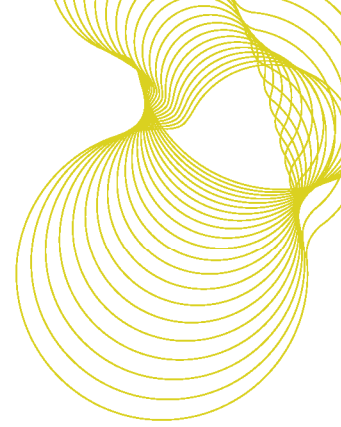
1 Introduction

At the request of Mr. T. Allison of Haler Lighting Ltd, Brooklands House, Sywell Aerodrome, Sywell, Northampton, NN6 0BT, BRE issued proposal 127010 in June 2010. The client accepted this on 14 June and BRE tested the specimen Halers H2 downlight on 17 June 2010.

Due to a change in product name for marketing reasons the original BRE report 263670 of June 2010 is re-issued here as 263670-2. The product reported on in 263670 is now known as 'Halers H2'. Other than the name there are no other changes.

The tests assess the air tightness of the specimen light fitting by using the method in BS EN 13141-1:2004¹ and criteria set in BS 5250: 2002² and Part C of the building regulations³.

The tests on the specimen fitting were carried out under the BRE Standard Terms and Conditions of Business for testing as part of BRE project number CV3890/Job Number 263670-2.

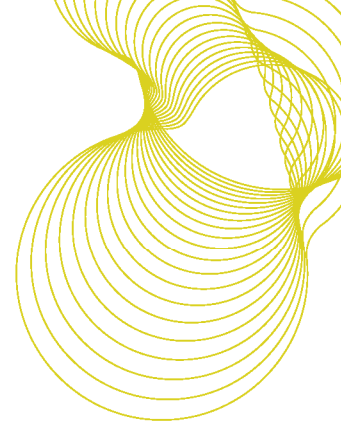


2 Details of tests carried out

Part C of the Building Regulations makes reference to *BS 5250: 2004 Code of practice for the control of condensation in buildings*. That standard refers to a test method to be used to measure the air tightness of the light fittings. The test method is in *BS EN 13141-1:2004 Ventilation for buildings – Performance testing of components/products for residential ventilation – Part 1: Externally and internally mounted air transfer devices*.

The air tightness test is performed by application of a series of air pressure differentials across the specimen with measurement of the air leakage through it at each pressure step. The maximum pressure differential was 100 Pa reached in pressure steps of 1, 2, 4, 8, 10, 15, 20, 30, 40, 50, 60, 80 and 100 Pascals.

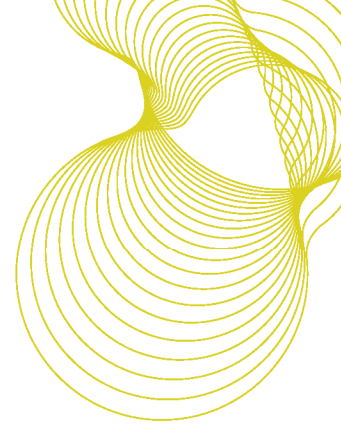
Measurement of the air tightness of the light fitting was carried out with the air pressure as positive on the room side of the downlight fitting. This causes air to flow through and around the light fitting into the space above the ceiling. The values measured therefore include air leakage through the light fitting assembly and through the ceiling to light fitting joint when this occurs.



3 Air leakage criterion

BS 5250 Clause 8.4.1.1.2 calls for designers to minimize the amount of moisture entering the roof (or other spaces above ceilings) by providing well sealed ceilings. The air tightness of ceilings is described in Clause 8.4.1.2 of that standard. Requirements for a well sealed ceiling with regard to recessed light fittings are given in BS 5250 Clause 8.4.1.2 Paragraph f.

Paragraph f states; '*Recessed light fittings should either comply with BS EN 60529 and be rated IP60 to IP65 (depending on room use), or incorporate an appropriate sealed hood or box which meets the following test criteria. The total leakage through all downlighters should not exceed 0.06 m³/h.m² of ceiling at 2 Pa. The leakage of individual downlighters can be tested using the method specified in 4.3 of BS EN 13141-1: 2004.*

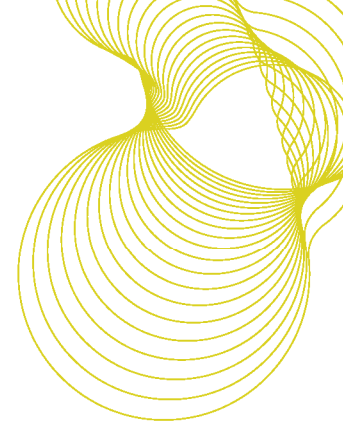


4 Test specimen – Halers H2 downlight fitting

Halers H2: 90 mm diameter. Area at the room side is 6362.6 mm². Circumference at room side of ceiling is 282.8 mm. Metal bodied, fixed down lighter with a chrome bezel, IP65.

Sealing washer at light fitting to ceiling joint. Light fitting mounted, recessed into a 17 mm thick MDF board through a 65 mm diameter hole. Spring clip pressure retains fitting to the ceiling. For these tests the spring clips were fitted to Position A on the light fittings as per the manufacturer's instructions.

Configuration: Figures and drawings in Annex A of this report show the general arrangement of the light fitting installed in a ceiling.



5 Test rig and preparation

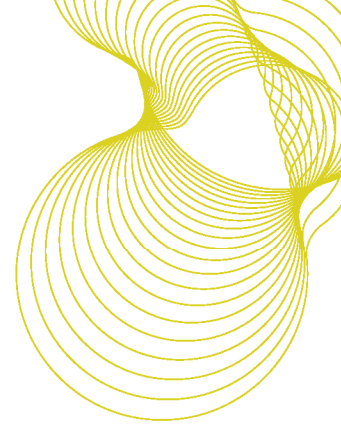
The specimen light fitting was installed into a 1.0 m square piece of 17 mm thick MDF board to simulate a stiff ceiling panel. This panel with specimen was clamped onto seals on the test rig. The light fitting is installed into the test rig with the back of the fitting outside of the test chamber. Air is pumped into the test rig to establish the test pressure differential across the light fitting under test and air leakage through it is measured on an air flow meter.

The test specimen was conditioned before testing commenced for at least 4 hours within the temperature range specified in the test standard of 20 +/-5°C.

BS EN 13141-1 requires that the test rig has a background leakage rate lower than 1 litre per second at 100 Pa. This equates to 3.6 m³/h at 100 Pa. The background leakage of the test rig was measured under positive pressures by using a plain sheet of MDF board clamped on to the test rig in place of the test specimen and mounting arrangement. This background leakage was subtracted from all measured test results. Table 1, below, shows the background leakage rate of the test rig, which is within the specified requirements of BS EN 13141-1.

	Air differential pressure. Pa												
	1	2	4	8	10	15	20	30	40	50	60	80	100
Air leakage m ³ /h	0.01	0.02	0.12	0.26	0.43	0.73	0.92	1.32	1.53	1.89	2.29	2.90	3.38

Table 1. Background air leakage rate from the test rig



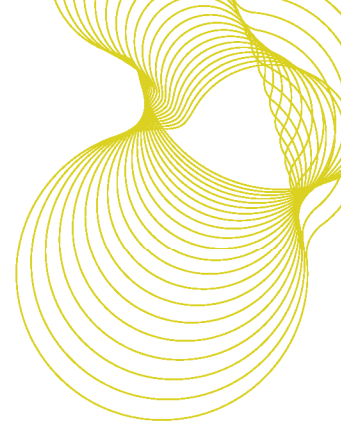
6 Summary of air tightness test results

The test results are summarised in Table 1 below. Detailed results are given in Annex 1.

BS 5250 test criteria	Halers H2 test specimen performance	
	Test results m ³ /h	Performance against criteria
At 2 Pa (Pascals) air leakage through recessed light fittings should not exceed 0.06 m ³ /h per m ² of ceiling	0.06	Criteria met The leakage rate of 0.06 m ³ /h at 2 Pa test pressure allows one Halers H2 fitting per m ² of ceiling

Table 1. Summary of air tightness test results

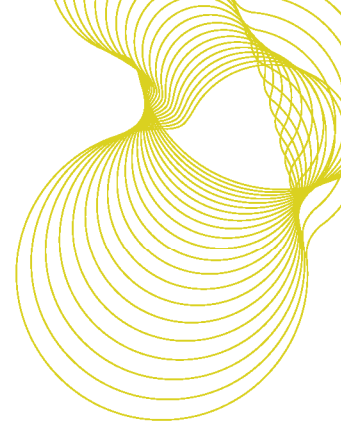
The results in Table 1 apply to all the colour variants of Halers Lighting Ltd Halers H2



7 Conclusions

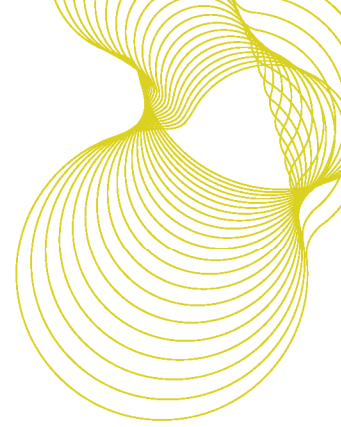
The Halers Lighting Ltd downlight fitting Halers H2 was tested in the manner and to the standard described herein. The results show that the rate of air leakage through and around the specimen was 0.06 m³/h per m² of ceiling at 2 Pa test pressure.

The rate of air leakage through the specimen Halers H2 light fitting measured in these tests means that one such light fitting could be placed in each square metre area of ceiling.



8 References

1. BS EN 13141-1:2004 Ventilation for buildings – Performance testing of components/products for residential ventilation – Part 1: Externally and internally mounted air transfer devices. BSI London
2. BS 5250: 2004 Code of practice for the control of condensation in buildings. BSI London.
3. Part C of the Building Regulations 2000. Site Preparation and resistance to contaminants and moisture. ODPM London.



ANNEX A.

Air tightness results

Test pressure Pa	Air flow through and around the HALERS H2 specimen m³/h
1	0.01
2	0.06
4	0.08
8	0.24
10	0.26
15	0.27
20	0.28
30	0.33
40	0.36
50	0.42
60	0.48
80	0.57
100	0.59

Table A1 Air tightness results for HALERS H2 light fitting

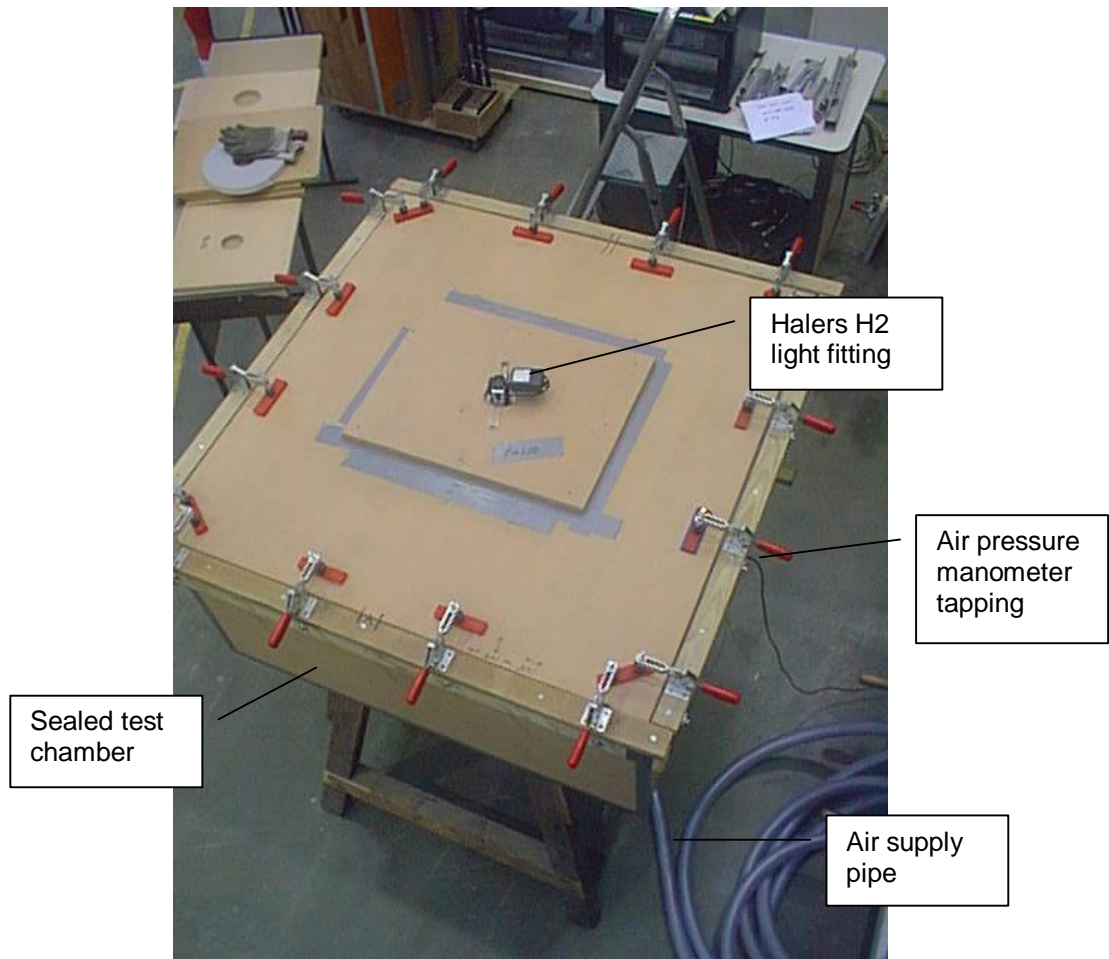
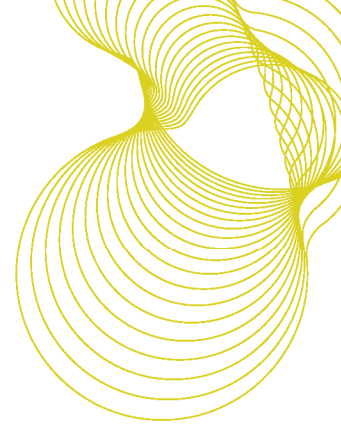


Figure A1. The test set up

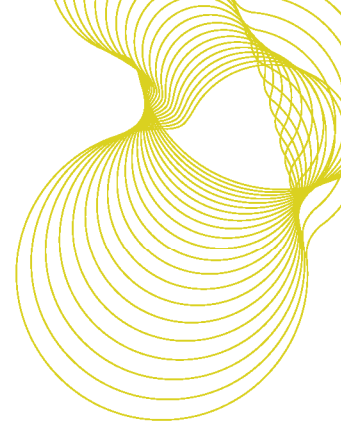


Figure A2. The room face of the Halers H2 down light fitting



Figure A3. Above the ceiling part of the Halers H2 down light fitting