



TEST REPORT

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UL 2043

**Standard for
Fire Test for Heat and
Visible Smoke Release for
Discrete Products and
Their Accessories
Installed in Air-Handling
Spaces**

**Drop In Ceiling Speaker
ACD 2 x 2 Speaker w/ Amp**

Project No. 16224-123832

February 15, 2005

Prepared for:

Intertek Testing Services
40 Commerce Way Unit B
Totowa, NJ 07512



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ABSTRACT

A metal speaker enclosure assembly submitted by **Intertek Testing Services** and identified as the "Drop In Ceiling Speaker ACD 2x2", was tested in accordance with the **UL 2043, Standard for Fire Test for Heat and Visible Smoke Release for Discrete Products and Their Accessories Installed in Air-Handling Spaces**, with the following results:

ITEM	RESULTS
Peak Heat Release (HRRc)	14.8 kW
Peak Normalized Optical Density	0.00468
Average Normalized Optical Density (10 min)	0.000549

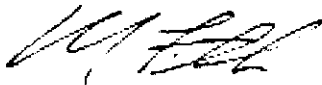
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Date: February 15, 2005

Reviewed and approved:



William E. Fitch P.E. No. 55294

Date: February 15, 2005



INTRODUCTION

This report describes the results of the UL 2043, Standard for Fire Test for Heat and Visible Smoke Release for Discrete Products and Their Accessories Installed in Air-Handling Spaces. This test method is for determining the fire performance response of electrical equipment intended to be installed in air handling spaces, such as above suspended ceilings. These products are subjected to an open flame ignition source and evaluated using a product calorimeter. The purpose of this test is to determine the rate of heat release and the rate of smoke release of the burning product samples as they relate to the requirements for fire-resistant and low-smoke-producing characteristics in accordance with the provisions of the National Electric Code, NFPA 70.

TEST SPECIMEN

The test specimen was described by the client as the “**Drop In Ceiling Speaker ACD 2x2 Speaker w/ Amp**”. The specimen consisted of an all metal speaker enclosure with a yellow a beige perforated cover and a black back cover which enclosed the speaker. The enclosure measured 2 ft x 2 ft. The specimen was tested with the specimen in its intended position with the perforated cover exposed to the test flame and offset slightly to impinge flames more directly on the area where the speaker was housed.

TEST PROCEDURE

All instrumentation was zeroed, and calibrated prior to testing. The test specimen, after conditioning to 73°F and 50% R.H., was placed on the specified test frame / enclosure. The 12” x 12” x 4” propane test burner was centered under the specimen and the test was started. The test specimen is exposed to a direct flame impingement with a heat release rate of 60 kW (92 cubic feet per hour). The test was conducted for 10 minutes at which time the gas burner is shut off.



ACCEPTANCE CRITERIA

- a) The peak rate of heat release measured during each test shall be 100 kilowatts or less.
- b) The peak normalized optical density measured during each test shall be 0.50 or less.
- c) The average normalized optical density (10 minute test duration) shall be 0.15 or less.

TEST RESULTS

The specimen was placed in the test enclosure and tested at 10:00 a.m. on February 14, 2005. The ambient temperature was 61°F, with a relative humidity of 62%. The data recorded includes: Smoke Release Rate (SRR), Heat Release Rate (HRR). The acceptance criteria data was calculated from these values using the formulas in UL 2043 Section 7. This data may be found in Appendix B. Photos of the sample before and after the test are included as Appendix C.

Observations during the test were recorded. The observations are as follows:

TIME (min:sec)	OBSERVATION
0:00	60 kW Burner ignited.
2:20	Light smoke from speaker compartment
4:08	Small flame ignited at edge of panel – self extinguished at 4:15
5:37	Audible popping sounds lasting until 6:30
9:30	No new activity
10:00	Test terminated – No afterflame.

ITEM	RESULTS
Peak Heat Release (HRRc)	14.8 kW
Peak Normalized Optical Density	0.00468
Average Normalized Optical Density (10 min)	0.000549



Post-Test Sample Observations

After the test, the specimen was observed to be damaged as follows:

The specimen was slightly discolored due to soot from the propane burner on the exposed side. The specimen displayed no signs of permanent warping. After removing the cover, the speaker cone was found to be charred and mostly consumed.

CONCLUSIONS

The **“Drop In Ceiling Speaker ACD 2x2 Speaker w/ Amp”** PASSED all of the criteria of stated in section 9 of the UL 2043, Standard for Fire Test for Heat and Visible Smoke Release for Discrete Products and Their Accessories Installed in Air-Handling Spaces.

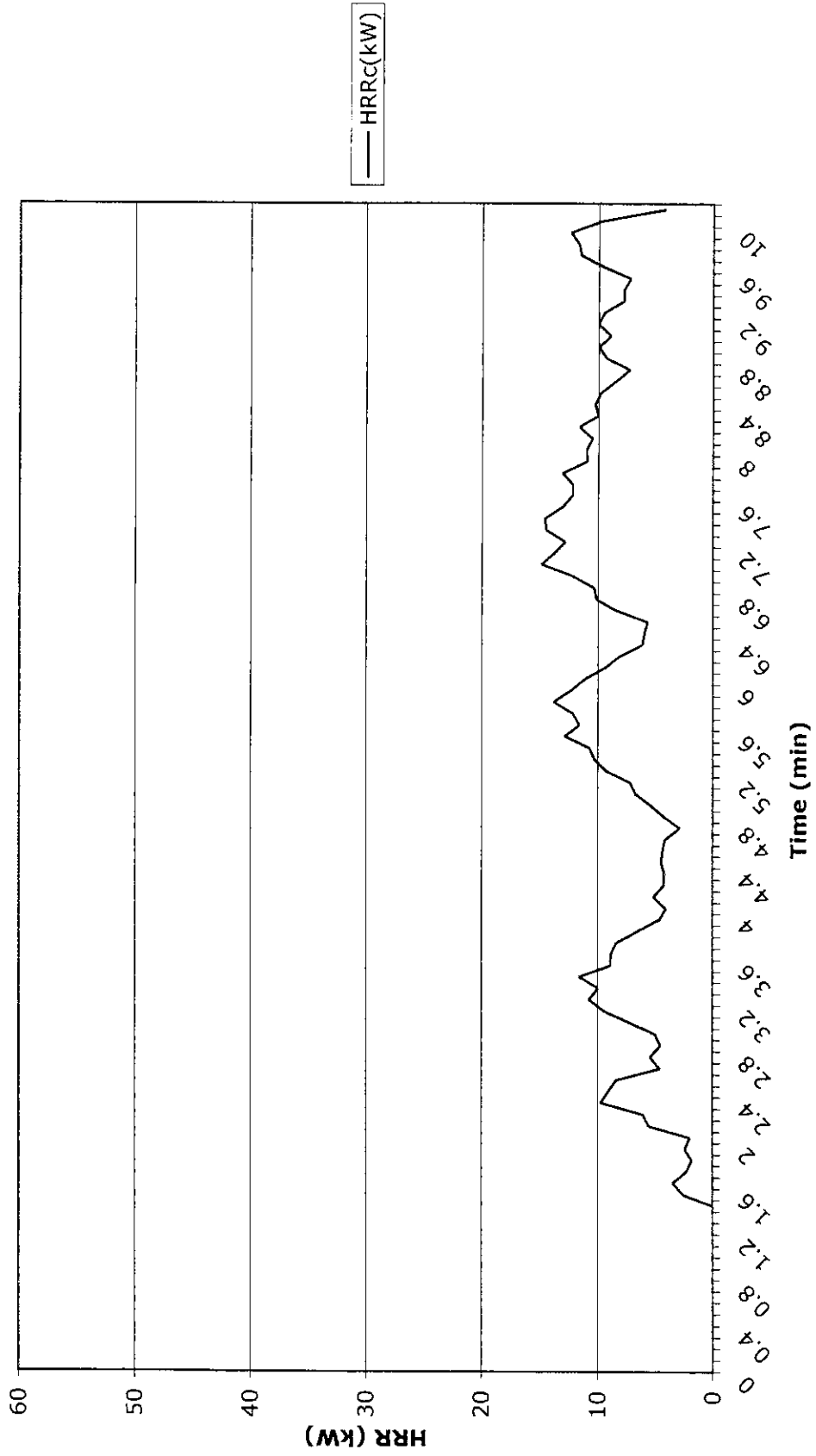


APPENDIX A

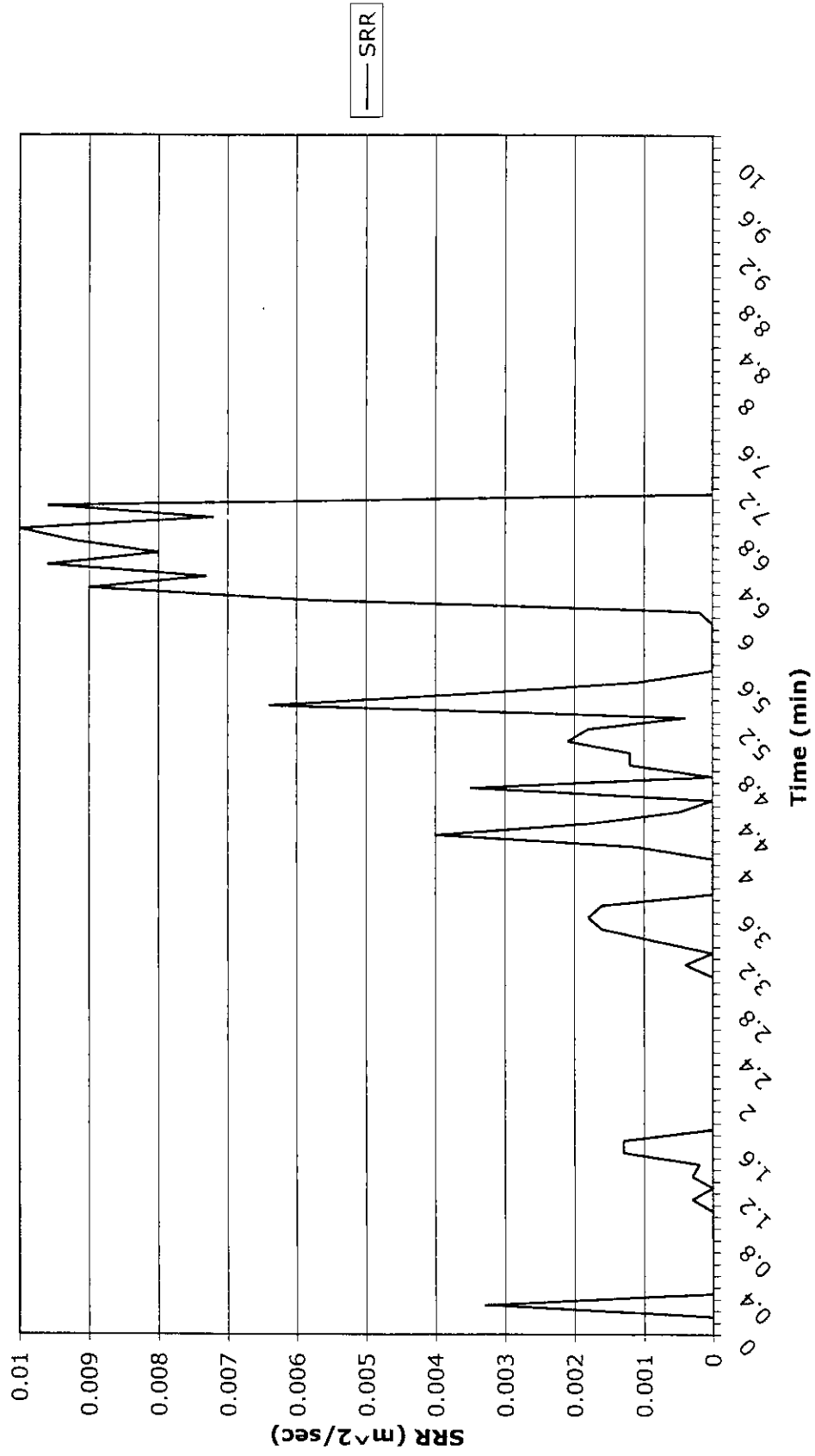
TEST DATA



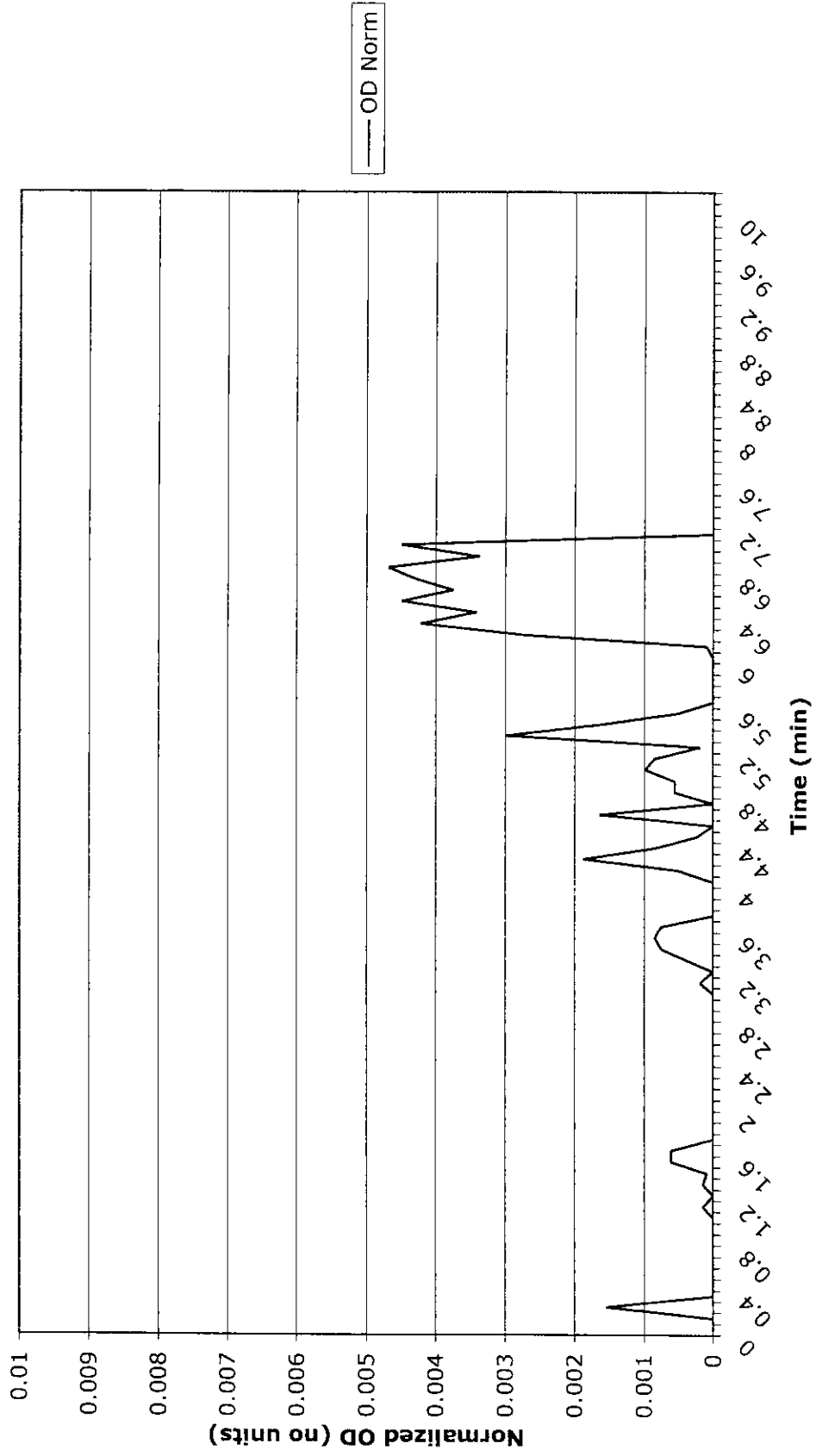
Intertek
Project No. 16224-123832
HRRc(kW) Heat Release Rate Corrected for 60 kW Burner Output



Intertek
Project No. 16224-123832
SRRc(kW) Smoke Release Rate Corrected for SRR from 60 kW Burner Output



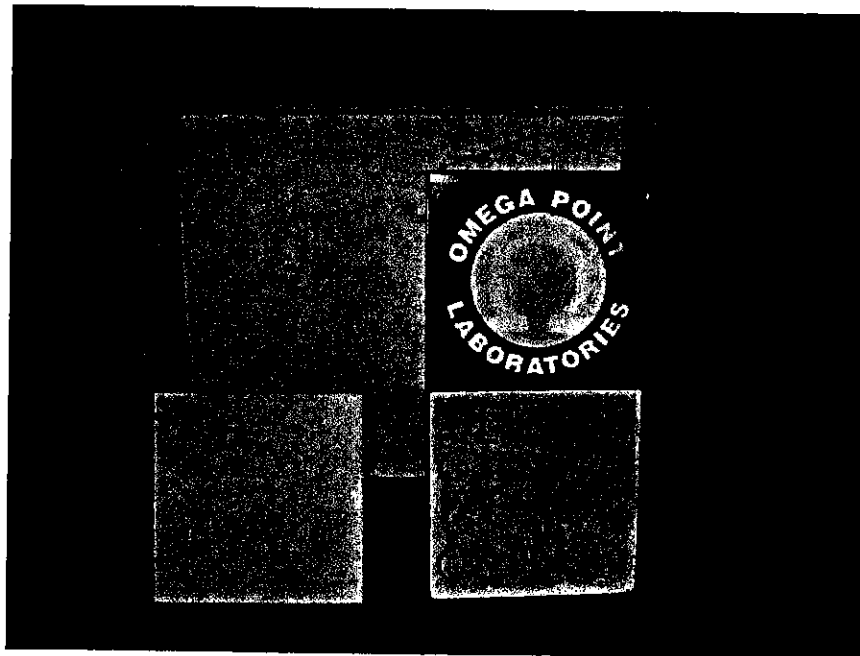
Intertek
Project No. 16224-123832
Normalized OD Calculated from SRR



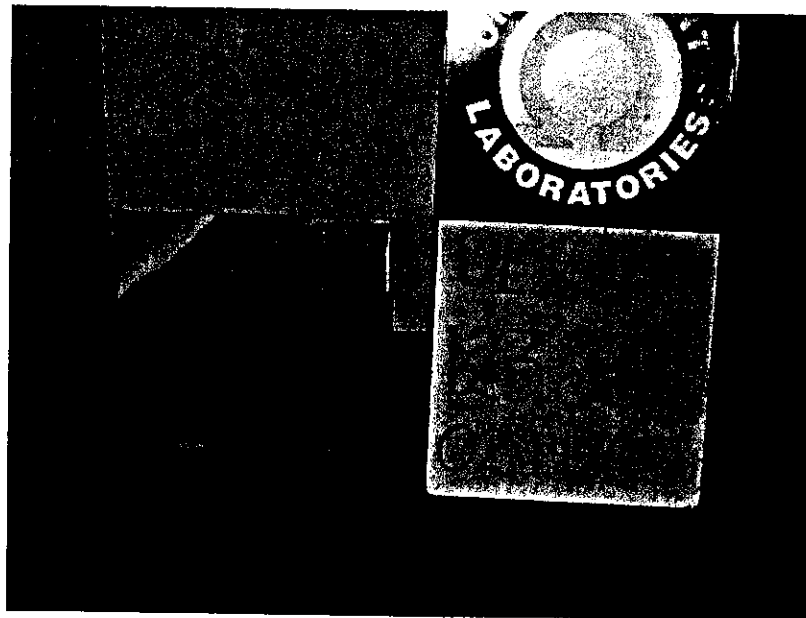
APPENDIX B

PHOTOGRAPHS





Test specimen before test.



Test specimen after test.





Speaker after test

LAST PAGE OF TEST REPORT

