



## REPORT

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Order No. 3114941

Date: June 20, 2007

REPORT NO. 3114941CRT-001c

### SOUND TRANSMISSION LOSS TESTS AND CLASSIFICATION OF 8 INCH THICK CONCRETE FILLED INSULATING CONCRETE FORMS

RENDERED TO

AIRLITE PLASTICS COMPANY  
6110 ABBOTT DRIVE  
OMAHA, NE 68108

#### INTRODUCTION

This report gives the results of Sound Transmission Loss tests and the determination of the Sound Transmission Class on 8 inch thick concrete filled Insulating Concrete Forms. The test sample was constructed and poured by the client at Intertek on May 2, 2007.

#### AUTHORIZATION

Signed Intertek Quote No. 500017888.

#### TEST METHOD

The specimen was tested in accordance with the American Society for Testing and Materials designation ASTM E90-2004, "Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions", and classified in accordance with the American Society for Testing and Materials designation ASTM E413-2004, "Classification for Rating Sound Insulation" and ASTM Standard E1332-90 (Re-Approved 2003) entitled, "Standard Classification for Determination of Outdoor-Indoor Transmission Class".

An independent organization testing for safety, performance, and certification.

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## **GENERAL**

The sound-insulating property of a partition element is expressed in terms of the sound transmission loss. The procedure for determining this quantity is to mount (and perimeter seal) the test specimen as a partition between two reverberation rooms. Sound is introduced in one of the rooms (the source room) and measurements are made of the noise reduction between source room (10,000 cu .ft.) and receiving room (16,640 cu. ft.). The rooms are so arranged and constructed that the only significant sound transmission between them is through the test specimen.

The test opening is constructed such that it is approximately one inch larger in size than the test specimen. The specimen is placed in the test opening an a half-inch bead of "DUX-SEAL", a dense, non-hardening, clay-like material, to isolate it from the supporting base. The space between the test specimen and the wall opening is sealed on both sides employing the same sealing material.

The purpose of the Sound Transmission Class (STC) is to provide a single figure rating that can be used for comparing the sound-insulating properties of partition elements used for general building design purposes. The higher the rating (STC) the greater the sound insulating properties of the partition.

The purpose of the Outdoor-Indoor Transmission (OITC) is to provide a single number rating that can be used for comparing building façade designs, including walls, doors, windows and combinations thereof. This rating is designed to correlate with subjective impressions of the ability of building elements to reduce the overall loudness of ground and air transportation noise. It is intended to be used as a rank ordering device.

## **DESCRIPTION OF TEST SPECIMEN**

The test specimen consisted of an 8 inch thick concrete filled Insulating Concrete Form. The walls of the form were 2 ½ inch thick expanded polystyrene panels. Plastic webbing bridged and supported the form with #4 re-bar in the center of the wall, spaced 16 inches on center both vertically and horizontally. The form was filled with 3000 psi., 6 inch slump concrete with 3/8 inch maximum aggregate and allowed to cure for over 45 days prior to testing.

Test #1 – Insulating concrete wall section alone

Test #2 – Wall section with ½ inch gypsum board screwed to both sides.

Test #3 - Wall section with ½ inch gypsum board screwed to the interior side and 5/16 inch thick HardiBoard on the exterior.



**RESULTS OF TESTS**

**8 inch thick concrete specimen**

| 1/3 Octave Band<br>Center Frequency<br>Hz | Sound Transmission Loss in dB |         |         |
|---|-------------------------------|---------|---------|
|   | Test #1                       | Test #2 | Test #3 |
| 80  | 22                            | 23      | 22      |
| 100                                       | 30                            | 29      | 29      |
| 125                                       | 33                            | 33      | 33      |
| 160                                       | 37                            | 37      | 36      |
| 200                                       | 40                            | 41      | 41      |
| 250                                       | 42                            | 42      | 42      |
| 315                                       | 44                            | 44      | 45      |
| 400                                       | 46                            | 44      | 42      |
| 500                                       | 48                            | 45      | 44      |
| 630                                       | 47                            | 44      | 43      |
| 800                                       | 49                            | 48      | 49      |
| 1000                                      | 52                            | 51      | 52      |
| 1250                                      | 58                            | 57      | 57      |
| 1600                                      | 60                            | 59      | 60      |
| 2000                                      | 54                            | 56      | 57      |
| 2500                                      | 59                            | 63      | 63      |
| 3150                                      | 48                            | 59      | 60      |
| 4000                                      | 52                            | 61      | 61      |
| 5000                                      | 53                            | 54      | 54      |
| Sound Transmission Class                  | 50                            | 50      | 50      |
| Outdoor-Indoor Transmission Class         | 39                            | 39      | 39      |

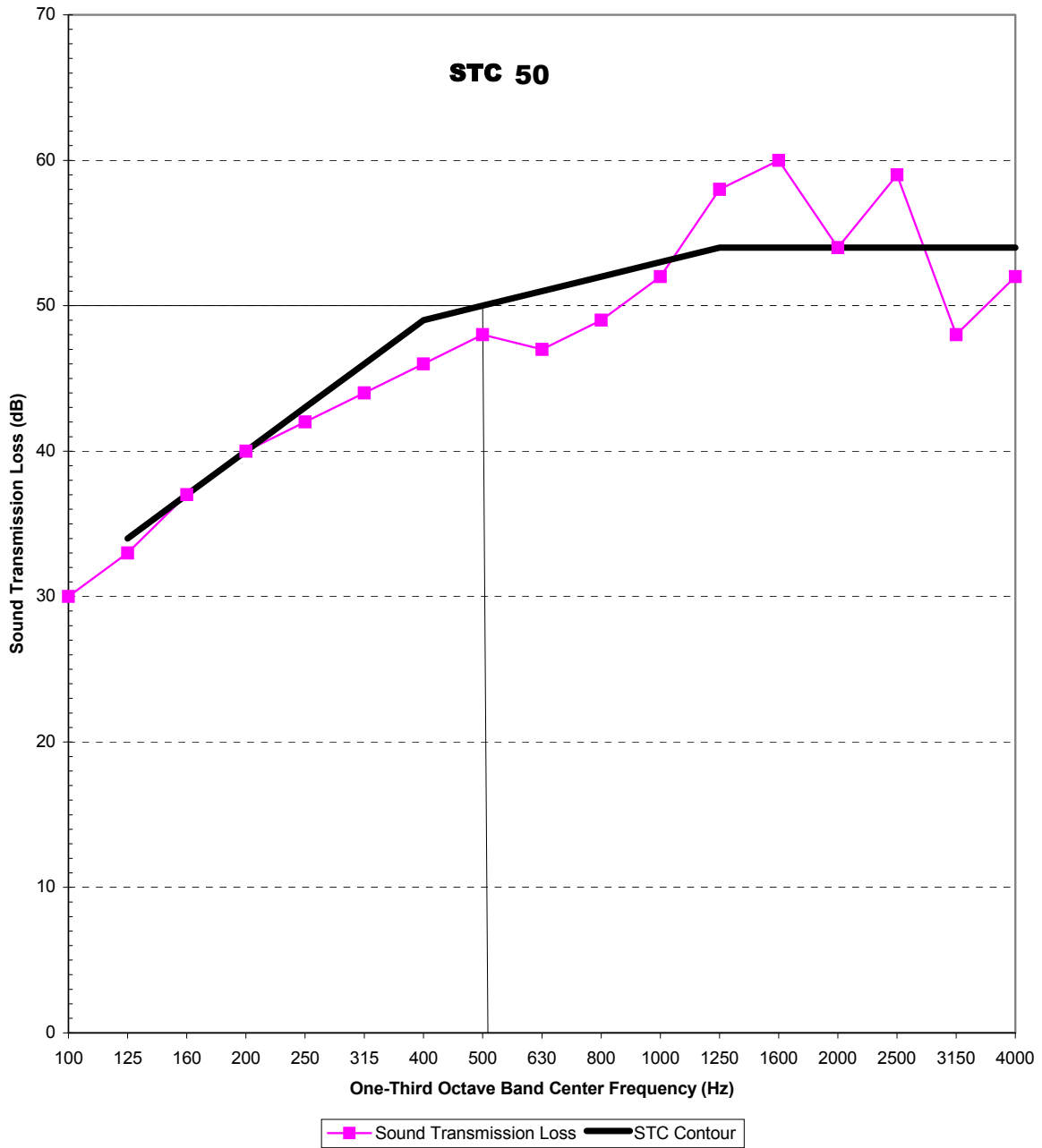
**PRECISION**

For any pair of rooms and microphone system, the 95% confidence interval  $\Delta TL$ , for transmission loss must be less than the following.

| Range of<br>One-Third Octave<br>Bands | Transmission Loss<br>Uncertainty, dB |        |
|---------------------------------------|--------------------------------------|--------|
|                                       | Required                             | Actual |
| 125 and 160                           | 3                                    | <1.5   |
| 200 and 250                           | 2                                    | <1.5   |
| 315 - 4000                            | 1                                    | <1     |

**Test #1**

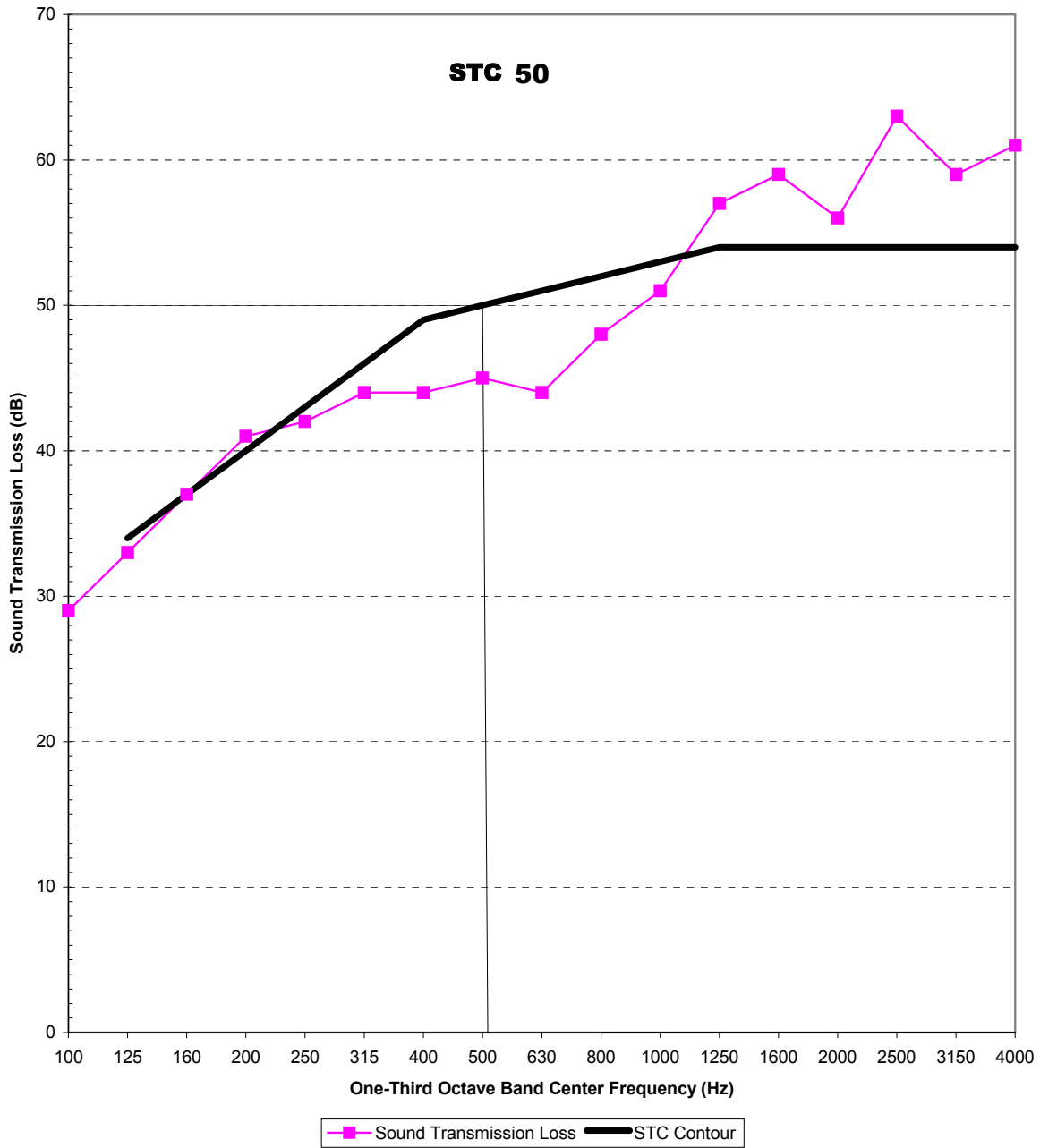
**Sound Transmission Loss**



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**Test #2**

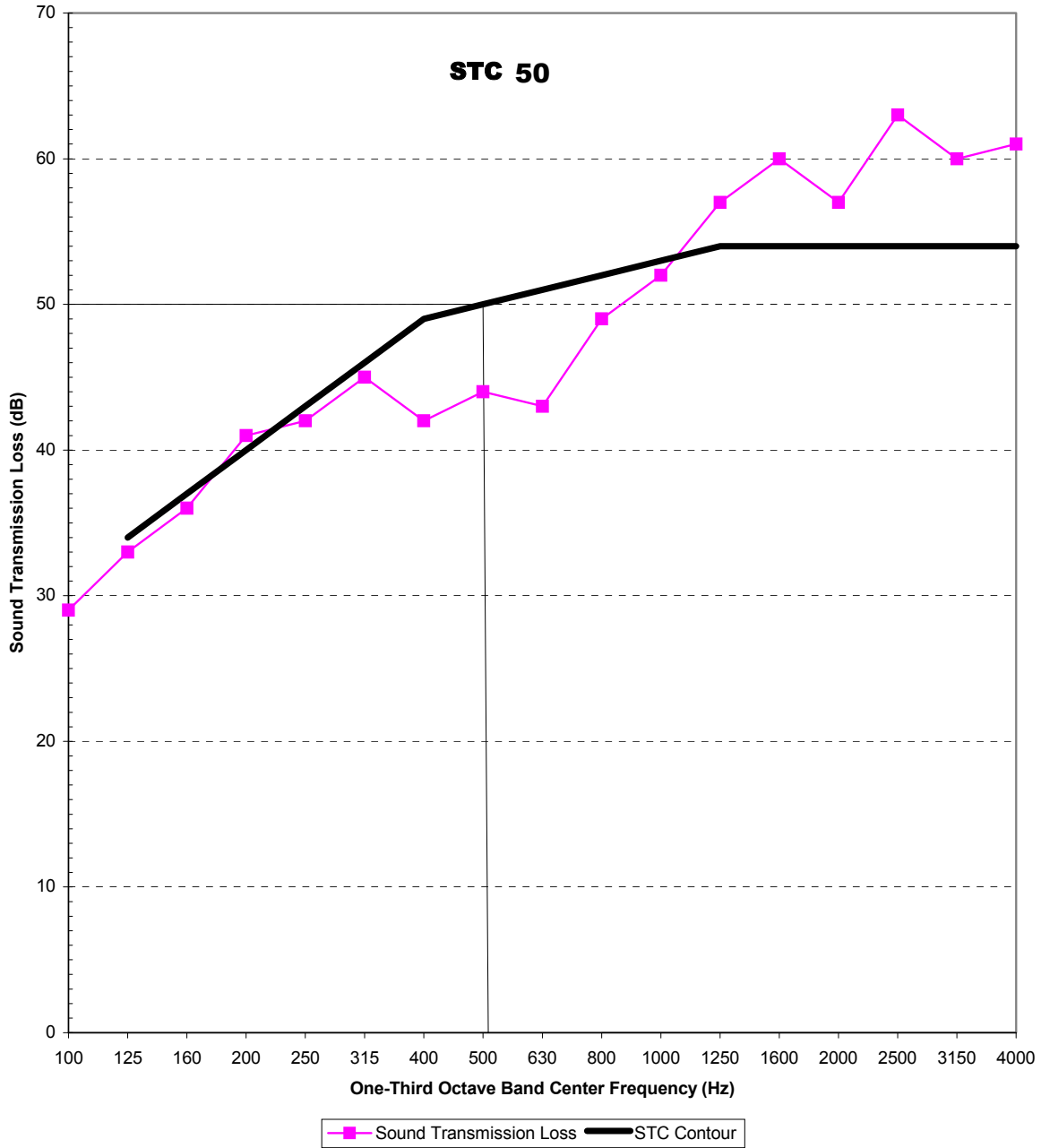
**Sound Transmission Loss**



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**Test #3**

**Sound Transmission Loss**



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**REMARKS**

- 1. Curing Period: Over 45 days
- 2. Ambient Temperature: 74°F
- 3. Relative Humidity: 41%

**CONCLUSION**

The test method employed for this test has no pass-fail criteria, therefore, the evaluation of the test results is left to the discretion of the client.

This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the federal government.

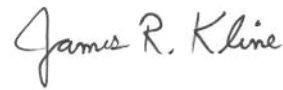
Date of Tests: June 20, 2007

Report Approved by:



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Engineering Team Leader  
Acoustical Testing

Report Reviewed By:



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Attachments: None