

# RSIC-1 ACOUSTIC ASSEMBLY

FLOOR/CEILING ASSEMBLY

DIRECT FIX TO CONCRETE SLAB



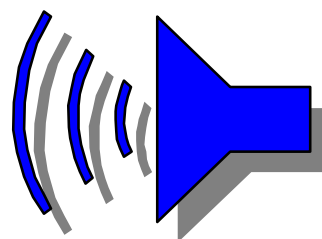
Toll Free 866-774-2100 • Telephone 503-649-7700

FCS1 DSWA FIIC 51



## CONSTRUCTION

- \* 8" PT concrete slab
- \* R-8 insulation
- \* RSIC-1 installed 48" oc.
- \* 7/8" furring channel 24" oc.
- \* 1 Layers 5/8" Gypsum Drywall



**FIELD SOUND  
TRANSMISSION  
CLASS**  
( Insul 5.5 )  
**STC 71**



**Fire resistance ratings**  
ANS/UL  
Non combustible design

**FIELD IMPACT  
ISOLATION  
CLASS**

**FIIC 51**



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4900 SW Griffith Drive, Suite 216  
Beaverton, OR 97005

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Report on

# Field Impact Insulation Class (FIIC) Test

Subject:

**Concrete Floor With Resiliently Mounted Ceiling  
Vancouver Center Apartments, Units 424/324**

Prepared for:

Mike Gernhart  
PAC International Inc.  
PO Box 5369  
Aloha OR 97006

DSA Test No: 129031-IIC1  
Conducted: May 12, 2003

## Summary

This report describes a test conducted to determine the Field Impact Insulation Class (FIIC) rating of a floor/ceiling system according to standard test procedures outlined in ASTM Designation E1007-97. The floor/ceiling system tested consisted of the following elements:

- An 8" thick post-tensioned concrete slab
- A single layer of 5/8" gypsum board resiliently mounted to the underside of the slab using PAC International RSIC-1 Resilient Sound Insulation Clips and 7/8" x 25 gauge furring channel.
- The 1-5/8" cavity between the concrete slab and the gypsum board was filled with R8 fiberglass batt insulation.

The test met all the requirements of ASTM E1007-97. When tested with no floor covering (bare concrete), the assembly achieved a FIIC rating of 51).

Tested by:

Joseph C. Begin  
Sr. Engineer

Approved by:



EXPIRES: 6/30/04

Principal

# Field Impact Insulation Class (FIIC) Test Report

For: PAC International Inc.  
On: Vancouver Center Apartments  
Floor/Ceiling System Unit 424 – Unit 324

DSA Test No: 129031-IIC1  
Conducted on: 05/22/2003

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## Conformance to Standards

A structure borne sound insulation field test was conducted at the request of PAC International Inc., to determine the Field Impact Insulation Class (FIIC) rating of a floor/ceiling system located between the living room of upper Unit 424 and the living room of lower Unit 324 at the Vancouver Center Apartments at the corner of 6<sup>th</sup> Avenue and Columbia Street, in Vancouver, Washington. The test was conducted in conformance to the test methods and procedures outlined in the American Society for Testing and Materials and E1007-97.

## Description of Test Environment

The subject of this test was the floor/ceiling system between the living room of Unit 424 and the living room of Unit 324 at the Vancouver Center Apartments. The impacted floor area was the bare concrete floor in the living room of Unit 424. The sound receiving space for the test was the living room area of Unit 324. The receiving space had a bare concrete floor, with gypsum board walls and ceiling, and there were no furnishings in the room at the time of the test. The dimensions of the floor/ceiling under test were approximately 13.9 feet by 12.5 feet. The total volume of the receiving space was calculated to be approximately 1,497 cubic feet.

The room had a set of patio doors to the outside, and on the interior wall, a doorway (without a door) separated the receiving room from the rest of the suite. For the test, the doorway in the interior wall was temporarily covered with two layers of 5/8" gypsum board. To minimize contamination of the test by exterior noise, the patio door was also temporarily covered with two layers of 5/8" gypsum board. The doorway between the living room and the laundry closet was also covered with gypsum board to further minimize potential flanking paths.

## Description of Test Specimen

The test specimen was the bare concrete floor in the living room of Unit 424 and the ceiling above the living room in Unit 324. The floor construction consisted of an 8" thick post-tensioned concrete slab. The ceiling system consisted of one layer of 5/8" Type X gypsum board attached to the underside of the concrete floor slab using PAC International's Resilient Sound Isolation Clip System with 7/8" x 25 gauge furring channel. The RSIC-1 clips were spaced at 24" x 48" OC, and were attached to the concrete slab with 2" powder actuated pins. The furring channel was spaced at 24" OC. The gypsum board was attached to the furring channel using 1-1/4" steel drywall screws. The gypsum board was cut so as to leave a 1/4" to 3/8" gap around the perimeter, where the ceiling meets the wall. This perimeter gap was then caulked with acoustical sealant. The gypsum board was then fire taped to seal all joints and drywall screws.

The ceiling of the receiving room had a 22-1/2" wide by 11-1/2" deep soffit running along the longer wall on one side. This soffit, which contained ducts and pipes, was formed using gypsum board attached the wall and the concrete slab with 20 gauge steel angles. This soffit was covered with an additional layer of 5/8" gypsum board, resiliently mounted with the PAC RSIC system.

## Description of Test Procedure

The test was conducted in accordance with the procedures outlined in ASTM Designation E1007-97. All measurements were made with a Larson Davis Model 800B Sound Level Meter (SLM), which meets the American National Standards Institute (ANSI) standard for Type 1 meters, and a computer-based spectral analysis program, which allows fast real-time acquisition and analysis of sound data. As specified in Sections 10.1, 10.3 and 10.6 of ASTM E1007-97, a single microphone was moved continuously along a defined traverse in order to obtain the necessary space-average levels. Absorption in the receiving room

# Field Impact Insulation Class (FIIC) Test Report

For: PAC International Inc.  
 On: Vancouver Center Apartments  
 Floor/Ceiling System Unit 424 – Unit 324

DSA Test No: 129031-IIC1  
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was calculated from the reverberation time measurement results as prescribed in the test procedure.

## Test Results

Table 1 presents the calculated normalized sound pressure level (SPL) values at each of sixteen standard 1/3-octave band test frequencies. Deficiencies in the data relative to an assigned Impact Insulation Class (IIC) curve are presented and used to establish an IIC rating per ASTM Designation E989-89. Table 1 also lists the receiving room absorption values in each frequency band.

As noted under Table 1, the receiving room volume was less than ideally required by ASTM E1007 (6.4) for testing in the 100 Hz 1/3-octave band. However, this would not affect the test result, because as the data shows, the FIIC rating was control by frequencies above 1600 Hz.

**Table 1 – Normalized Impact Sound Pressure Levels for Bare Concrete Floor/Ceiling System Between Vancouver Center Apartments Units 424 and 324**

1/3 Octave Center Frequency (Hz)	Normalized Impact SPL (dB)	Deficiency (dB)	Receiving Room Absorption (Sabins)	Notes	1/3 Octave Center Frequency (Hz)	Normalized Impact SPL (dB)	Deficiency (dB)	Receiving Room Absorption (Sabins)	Notes
100	50	0	129	1	630	42	0	42	
125	50	0	66		800	43	0	42	
160	49	0	64		1000	43	0	47	
200	46	0	52		1250	43	0	50	
250	45	0	49		1600	45	0	54	
315	43	0	44		2000	50	3	61	
400	45	0	41		2500	51	7	64	
500	42	0	39		3150	49	8	61	
Total Deficiencies = 18					<b>FIIC = 51</b>				

Notes: 1. Receiving room volume was less than the ideal value specified in ASTM E1007-97 (6.4) for testing in the 100 Hz band

## Field Impact Insulation Class (FIIC)

The rating of the floor ceiling system with no floor covering is FIIC-51. The deficiencies between the recorded sound pressure levels and the assigned IIC curve total 18 dB, with no deficiency exceeding 8 dB in any 1/3-octave frequency band.

Figure 1 displays the normalized measured SPL values and the FIIC contour.

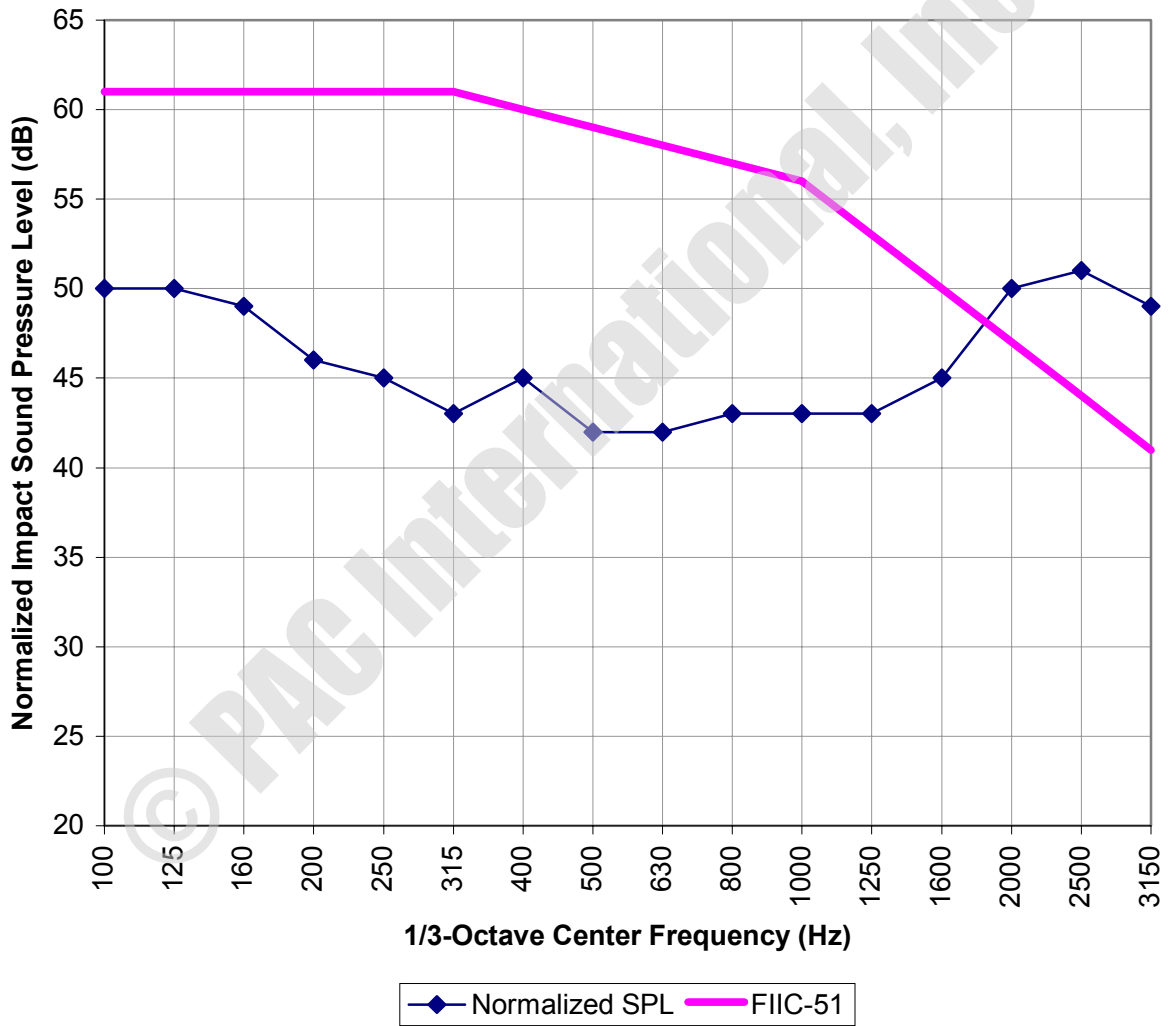
# Field Impact Insulation Class (FIIC) Test Report

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Floor/Ceiling System Unit 424 – Unit 324

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Conducted on: 05/22/2003

Figure 1

## Vancouver Center Apartments - 424/324 - Bare Concrete Floor



# Sound Insulation Prediction (v5.5)



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PAC

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Margin of error is generally within +/- 3STC

JobName:

Notes:

Job No.:

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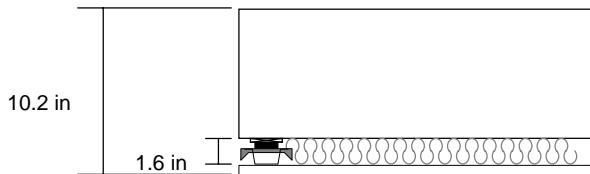
DSA Vanc SCT 71

Date: 25 May 04

Initials:

File name:insul

1 x 8.0 in Concrete



$f_n = 80$  Hz  
1 x 0.6 in Type X Gypsum Board  
thickness 2 in

**STC 71**  
**OITC 51**

Panel size 8.9x13 ft

Surf. mass 97.4 lb/ft<sup>2</sup>

Crit. freq 147 Hz

damping 0.01

Surf. mass 2.9 lb/ft<sup>2</sup>

Crit. freq 1997 Hz

damping 0.01

Frequency (Hz)	TL(dB)	TL(dB)
50	41	
63	40	36
80	33	
100	45	
125	47	47
160	50	
200	56	
250	61	59
315	67	
400	71	
500	75	74
630	79	
800	82	
1000	85	84
1250	87	
1600	88	
2000	87	88
2500	89	
3150	92	
4000	94	93
5000	96	

