



Acoustical Testing Laboratory



Accredited by the National Voluntary
Laboratory Accreditation Program
for the specific scope of accreditation
under Lab Code 200291

TEST REPORT

For

Transwall Office Systems
1220 Wilson Drive
West Chester, PA 19380
Frank Lytle / 484-877-7131

Sound Attenuation of Suspended Ceiling Test ASTM E 1414/E 1414M - 11 / E 413 - 10 On

Mineral Fiber Demountable Ceiling System and Panels;
5/8 Inch x 2 Foot x 2 Foot Panels

Report Number: NGC 6011015

Page 1 of 4

Assignment Number: G- 744

Test Date: 12/19/2011

Report Date: 03/26/2012

Submitted by:

Andrew E. Heuer
Test and Quality Engineer

Reviewed by:

Robert J. Menchetti
Director

The results reported above apply to specific samples submitted for measurement.
No responsibility is assumed for performance of any other specimen.
This report may not be reproduced except in full, without the written approval of the laboratory.
The laboratory's accreditation or any of its test reports in no way constitutes or implies product certification, approval,
or endorsement by NVLAP or any agency of the U.S. Government.

Report Number: NGC 6011015

Test Method: This test method conforms explicitly with the American Society for Testing and Materials Standard Test Method for Airborne Sound Attenuation Between Rooms Sharing a Common Ceiling Plenum. Designation: E 1414/E 1414M - 11 / E 413 - 10

Specimen Designation: A typical 2 foot x 2 foot suspended ceiling grid system was used for this test. Into this grid were mounted nominal 5/8 inch x 2 foot x 2 foot mineral fiber ceiling panels.

Grid System Description: Suspended ceiling system consisting of nominal 2 foot by 2 foot lay-in mineral fiber ceiling panels.

The T-grid system was Chicago Metallic Exposed Tee System. Main tee part number 211.01H. Cross tee part number 209.01H. Tee cross number 229.01H. All mains and tees had a 23.8mm (15/16 in.) wide face.

The specimen was sealed with caulk between the grid face and the top of the dividing partition. The metal grid system was installed continuous at the dividing partition.

Ceiling Panel Description: Ceiling panels were observed to consist of:

Panels are lay-in type having a Trim Edge.

Face Finish – White Painted face, Fissured and Perforated

Panel Core – Mineral Fiber

Back Finish - Backcoated

All weights and dimensions are averaged:

Overall Thickness: 14.6mm (0.573 in.).

Weight: 3.03 kg/m² (0.62 PSF)

Panel Size: 603.2mm x 603.2mm (23-3/4 in. x 23-3/4 in.)

Ceiling Test Area: 26 sq. meters

Suspension System Type: CE.

Data Normalization: The 'direct method' of measuring the receiving room absorption was used.

Preconditioning: Minimum 24 hours at 70 (F), 55% RH.

Test Results: The results of the tests are given on pages 3 and 4.

The results reported above apply to specific samples submitted for measurement.

No responsibility is assumed for performance of any other specimen.

This report may not be reproduced except in full, without the written approval of the laboratory.

The laboratory's accreditation or any of its test reports in no way constitutes or implies product certification, approval, or endorsement by NVLAP or any agency of the U.S. Government.

Acoustical Testing Laboratory

Sound Attenuation by Suspended Ceiling

Test: ASTM E 1414 / E1414M-11 / ASTM E 413 - 10

Page 3 of 4

Test Report: NGC6011015

Date: 12/19/2011

Spec. Area [m²]: 12

Source room

Volume [m³]: 41.26

Rm Temp [°C]: 16.0

Humidity [%]: 56

Receiving room

Volume [m³]: 41.26

Rm Temp [°C]: 16.0

Humidity [%]: 56

Ceiling Attenuation Class CAC [dB] = 34

Sum of Unfavorable Deviations [dB]: 32

Maximum Unfavorable Deviation [dB]: 8 at 315 Hz

Frequency	D _{n,c}	L1	L2	d	Corr.	u.Dev.	ΔD _{n,c}
[Hz]	[dB]	[dB]	[dB]	[dB/s]	[dB]	[dB]	
100	15	102.6	90.6	54.6	3.0		
125	20	100.2	82.4	71.9	2.2		2.3
160	24	96.9	75.1	67.2	2.2		2.3
200	27	100.9	76.3	61.3	2.4		1.6
250	23	99.2	78.5	59.3	2.3	4	1.1
315	22	97.2	77.0	68.4	1.7	8	0.6
400	26	96.6	72.4	76.6	1.8	7	0.6
500	29	98.3	70.9	79.4	1.6	5	1.1
630	30	97.2	68.5	89.5	1.3	5	0.6
800	33	96.1	62.9	102.2	-0.1	3	0.8
1000	37	97.2	60.2	111.2	0.0		0.9
1250	39	93.8	54.1	125.2	-0.7		0.8
1600	42	91.2	48.1	139.2	-1.1		0.7
2000	44	90.8	45.3	141.6	-1.5		0.5
2500	46	91.2	44.2	143.0	-1.1		0.5
3150	46	89.7	42.2	151.0	-1.5		0.5
4000	46	89.6	41.8	148.4	-1.8		0.6
5000	49	90.0	39.7	151.4	-1.3		

D_{n,c} = Normalized Ceiling Attenuation, dB
 L1 = Source Room Level, dB
 L2 = Receiving Room Level, dB
 d = Decay Rate, dB/second
 Δ D_{n,c} = Uncertainty for 95% Confidence Level

The results reported above apply to specific samples submitted for measurement.

No responsibility is assumed for performance of any other specimen.

This report may not be reproduced except in full, without the written approval of the laboratory.

The laboratory's accreditation or any of its test reports in no way constitutes or implies product certification, approval, or endorsement by NVLAP or any agency of the U.S. Government.

Sound Attenuation by Suspended Ceiling

Page 4 of 4

Test: ASTM E 1414 / E1414M-11 / ASTM E 413 - 10

Test Report: NGC6011015

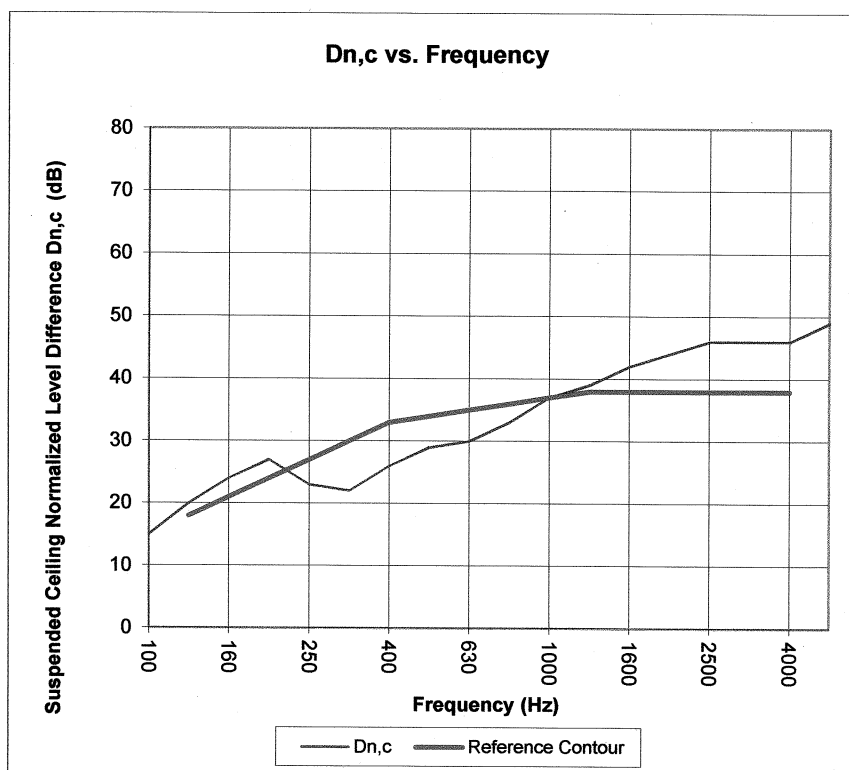
Test Date: 12/19/2011

Specimen Size [m²]: 12

Ceiling Attenuation Class CAC [dB] = 34 dB

Frequency [Hz]	D _{n,c} [dB]	ΔD _{n,c}
100	15	
125	20	2.3
160	24	2.3
200	27	1.6
250	23	1.1
315	22	0.6
400	26	0.6
500	29	1.1
630	30	0.6
800	33	0.8
1000	37	0.9
1250	39	0.8
1600	42	0.7
2000	44	0.5
2500	46	0.5
3150	46	0.5
4000	46	0.6
5000	49	

* Due to high insulating value of specimen, background levels limit results at these frequencies.



D_{n,c} = Normalized Ceiling Attenuation, dB
 Δ D_{n,c} = Uncertainty for 95% Confidence Level

The results reported above apply to specific samples submitted for measurement.

No responsibility is assumed for performance of any other specimen.

This report may not be reproduced except in full, without the written approval of the laboratory.

The laboratory's accreditation or any of its test reports in no way constitutes or implies product certification, approval, or endorsement by NVLAP or any agency of the U.S. Government.



Acoustical Testing Laboratory



Accredited by the National Voluntary
Laboratory Accreditation Program
for the specific scope of accreditation
under Lab Code 200291

TEST REPORT

For

Transwall Office Systems
1220 Wilson Drive
West Chester, PA 19380
Frank Lytle / 484-877-7131

Sound Attenuation of Suspended Ceiling Test

ASTM E 1414/E 1414M - 11 / E 413 - 10

On

Mineral Fiber Demountable Ceiling System and Panels;
5/8 Inch x 2 Foot x 2 Foot Panels
With Return Air Grilles

Report Number: NGC 6011016

Page 1 of 4

Assignment Number: G- 744

Test Date: 12/20/2011

Report Date: 03/26/2012

Submitted by:

Andrew E. Heuer
Test and Quality Engineer

Reviewed by:

Robert J. Menchetti
Director

The results reported above apply to specific samples submitted for measurement.

No responsibility is assumed for performance of any other specimen.

This report may not be reproduced except in full, without the written approval of the laboratory.

The laboratory's accreditation or any of its test reports in no way constitutes or implies product certification, approval, or endorsement by NVLAP or any agency of the U.S. Government.

Test Method: This test method conforms explicitly with the American Society for Testing and Materials Standard Test Method for Airborne Sound Attenuation Between Rooms Sharing a Common Ceiling Plenum. Designation: E 1414/E 1414M - 11 / E 413 - 10

Specimen Designation: A typical 2 foot x 2 foot suspended ceiling grid system was used for this test. Into this grid were mounted nominal 5/8 inch x 2 foot x 2 foot mineral fiber ceiling panels. In addition, one 2 foot by 2 foot panel in each of the test rooms was replaced with an HVAC return air grille. The return air grilles were each installed the same four to six foot distance from the dividing partition of the two test rooms and directly opposite each other. These grilles were left open with no plenum backing material. The return air grilles measured 23-3/4 in. x 23-3/4 in.

Grid System Description: Suspended ceiling system consisting of 2 foot x 2 foot lay-in mineral fiber ceiling panels. The T-grid system was Chicago Metallic Exposed Tee System. Main tee part number 211.01H. Cross tee part number 209.01H. Tee cross number 229.01H. All mains and tees had a 23.8mm (15/16 in.) wide face.

The specimen was sealed with caulk between the grid face and the top of the dividing partition. The metal grid system was installed continuous at the dividing partition.

Ceiling Panel Description: Panels are lay-in type having a Trim Edge.

Face Finish – White Painted face, Fissured and Perforated

Panel Core – Mineral Fiber

Back Finish - Backcoated

All weights and dimensions are averaged:

Overall Thickness: 14.6mm (0.573 in.).

Weight: 3.03 kg/m² (0.62 PSF)

Panel Size: 603.2mm x 603.2mm (23-3/4 in. x 23-3/4 in.)

Ceiling Test Area: 26 sq. meters

Suspension System Type: CE.

Data Normalization: The 'direct method' of measuring the receiving room absorption was used.

Preconditioning: Minimum 24 hours at 70 (F), 55% RH.

Test Results: The results of the tests are given on pages 3 and 4.

The results reported above apply to specific samples submitted for measurement.

No responsibility is assumed for performance of any other specimen.

This report may not be reproduced except in full, without the written approval of the laboratory.

The laboratory's accreditation or any of its test reports in no way constitutes or implies product certification, approval, or endorsement by NVLAP or any agency of the U.S. Government.

Sound Attenuation by Suspended Ceiling

Test: ASTM E 1414 / E1414M-11 / ASTM E 413 - 10

Page 3 of 4

Test Report: NGC6011016

Date: 12/20/2011

Spec. Area [m²]: 12

Source room

Volume [m³]: 41.26

Rm Temp [°C]: 18.0

Humidity [%]: 53

Receiving room

Volume [m³]: 41.26

Rm Temp [°C]: 18.0

Humidity [%]: 53

Ceiling Attenuation Class CAC [dB] = 30

Sum of Unfavorable Deviations [dB]: 31

Maximum Unfavorable Deviation [dB]: 5 at 315 Hz

Frequency	D _{n,c}	L1	L2	d	Corr.	u.Dev.	ΔD _{n,c}
[Hz]	[dB]	[dB]	[dB]	[dB/s]	[dB]	[dB]	
100	13	104.2	94.0	54.5	2.8		
125	18	101.2	85.4	66.9	2.1		2.1
160	22	98.0	77.1	77.7	1.2		2.1
200	25	102.2	79.6	62.9	2.4		1.6
250	22	100.5	80.7	62.8	2.2	1	0.9
315	21	98.8	79.3	74.4	1.5	5	1.1
400	24	97.8	75.3	81.3	1.5	5	0.6
500	25	99.6	75.1	85.9	0.5	5	1.4
630	26	98.5	73.6	93.1	1.0	5	0.8
800	28	97.6	69.9	105.3	0.3	4	0.9
1000	31	98.6	67.7	111.9	0.1	2	0.7
1250	32	95.5	63.1	129.8	-0.5	2	0.6
1600	33	92.9	58.4	138.4	-1.5	1	0.5
2000	33	92.2	57.8	145.4	-1.4	1	0.7
2500	35	93.0	56.9	148.1	-1.1		0.6
3150	35	91.3	54.5	152.3	-1.8		0.7
4000	35	91.3	54.6	148.6	-1.7		0.6
5000	36	91.7	53.9	147.1	-1.7		

D_{n,c} = Normalized Ceiling Attenuation, dB
 L1 = Source Room Level, dB
 L2 = Receiving Room Level, dB
 d = Decay Rate, dB/second
 Δ D_{n,c} = Uncertainty for 95% Confidence Level

The results reported above apply to specific samples submitted for measurement.

No responsibility is assumed for performance of any other specimen.

This report may not be reproduced except in full, without the written approval of the laboratory.

The laboratory's accreditation or any of its test reports in no way constitutes or implies product certification, approval, or endorsement by NVLAP or any agency of the U.S. Government.

Sound Attenuation by Suspended Ceiling

Page 4 of 4

Test: ASTM E 1414 / E1414M-11 / ASTM E 413 - 10

Test Report: NGC6011016

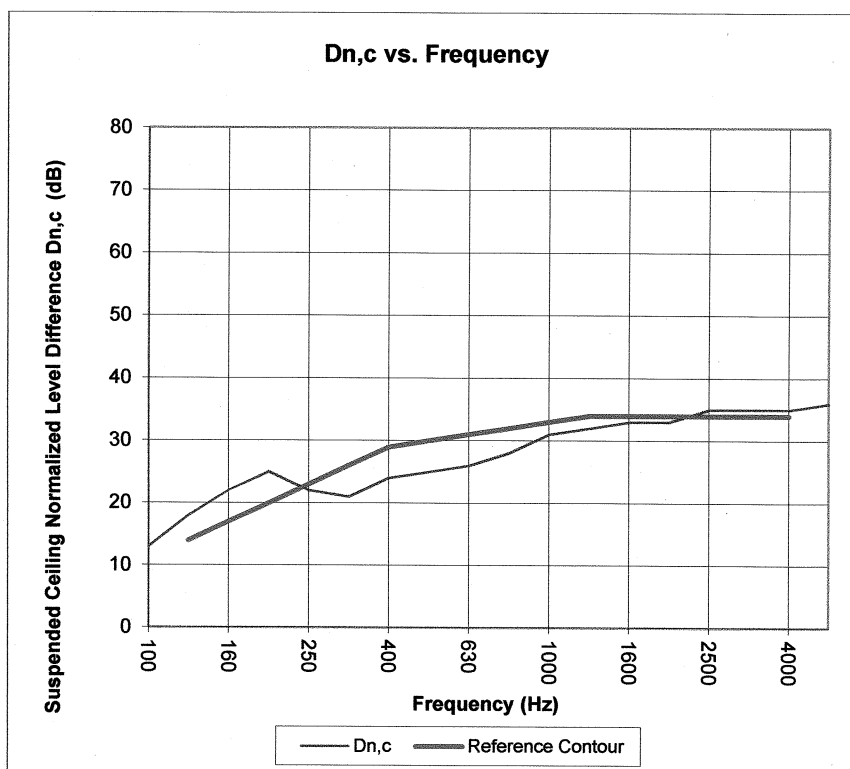
Test Date: 12/20/2011

Specimen Size [m²]: 12

Ceiling Attenuation Class CAC [dB] = 30 dB

Frequency	$D_{n,c}$	$\Delta D_{n,c}$
[Hz]	[dB]	
100	13	
125	18	2.1
160	22	2.1
200	25	1.6
250	22	0.9
315	21	1.1
400	24	0.6
500	25	1.4
630	26	0.8
800	28	0.9
1000	31	0.7
1250	32	0.6
1600	33	0.5
2000	33	0.7
2500	35	0.6
3150	35	0.7
4000	35	0.6
5000	36	

* Due to high insulating value of specimen, background levels limit results at these frequencies.



$D_{n,c}$ = Normalized Ceiling Attenuation, dB
 $\Delta D_{n,c}$ = Uncertainty for 95% Confidence Level

The results reported above apply to specific samples submitted for measurement.

No responsibility is assumed for performance of any other specimen.

This report may not be reproduced except in full, without the written approval of the laboratory.

The laboratory's accreditation or any of its test reports in no way constitutes or implies product certification, approval, or endorsement by NVLAP or any agency of the U.S. Government.



Acoustical Testing Laboratory



Accredited by the National Voluntary
Laboratory Accreditation Program
for the specific scope of accreditation
under Lab Code 200291

TEST REPORT

For

Transwall Office Systems
1220 Wilson Drive
West Chester, PA 19380
Frank Lytle / 484-877-7131

Sound Attenuation of Suspended Ceiling Test

ASTM E 1414/E 1414M - 11 / E 413 - 10

On

**Mineral Fiber Demountable Ceiling System and Panels;
5/8 Inch x 2 Foot x 2 Foot Panels
With AcoustiCAP Installed on Return Air Grilles**

Report Number: NGC 6011017


Page 1 of 4

Assignment Number: G- 744

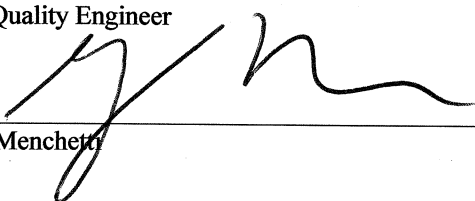
Test Date: 12/20/2011

Report Date: 03/26/2012

Submitted by: _____


Andrew E. Heuer
Test and Quality Engineer

Reviewed by: _____


Robert J. Menchetti
Director

The results reported above apply to specific samples submitted for measurement.

No responsibility is assumed for performance of any other specimen.

This report may not be reproduced except in full, without the written approval of the laboratory.

The laboratory's accreditation or any of its test reports in no way constitutes or implies product certification, approval, or endorsement by NVLAP or any agency of the U.S. Government.

Acoustical Testing Laboratory

Report Number: NGC 6011017

Test Method: This test method conforms explicitly with the American Society for Testing and Materials Standard Test Method for Airborne Sound Attenuation Between Rooms Sharing a Common Ceiling Plenum. Designation: E 1414/E 1414M - 11 / E 413 - 10

Specimen Designation: A typical 2 foot x 2 foot suspended ceiling grid system was used for this test. Into this grid were mounted nominal 5/8 inch x 2 foot x 2 foot mineral fiber ceiling panels. In addition, one 2 foot by 2 foot panel in each test room was replaced with an HVAC return air grille. The return air grilles were installed the same four to six foot distance from the dividing partition of the two test rooms and directly opposite each other. An AcoustiCAP test unit with backed all natural fiber strips battening was installed onto each return air grille. When the AcoustiCap units were installed onto the return air grilles, they were installed perpendicular to each other.

AcoustiCap Description: Each AcoustiCAP unit was observed to be a 23.5 inch (596.9mm) by 31 inch (787.4mm) piece of 0.035 inch (.89mm) thick sheet metal that was bent to form an dome. The height of the dome was nominally 7 inches (177.8mm). A nominal 1-1/2 inch cotton insulation was adhesively adhered to the underside of the metal. Each AcoustiCAP dome weighed 6.9 pounds (3.12 kg.). When installed onto each return air grille, each AcoustiCAP dome sat on two strips of 1-1/2 inch (38.1mm) thick x 21-1/2 inch (546.1mm) long x 6.5 inch (165.1mm) wide cotton battening.

Grid System Description: Suspended ceiling system consisting of nominal 2 foot by 2 foot lay-in mineral fiber ceiling panels.

The T-grid system was Chicago Metallic Exposed Tee System. Main tee part number 211.01H. Cross tee part number 209.01H. Tee cross number 229.01H. All mains and tees had a 23.8mm (15/16 in.) wide face.

The specimen was sealed with caulk between the grid face and the top of the dividing partition. The metal grid system was installed continuous at the dividing partition.

Ceiling Panel Description: Ceiling panels were observed to consist of: Nominal 603.2mm x 603.2mm (23-3/4 in. x 23-3/4 in.) Trim Edge Mineral Fiber Lay-in ceiling panels. The panels were 14.6mm (0.573 in.) thick and weighed 3.03 kg/m² (0.62 PSF). These panels had a white painted Front Face that was both Fissured and Perforated. All panels had a Backcoating.

Ceiling Test Area: 26 sq. meters
Suspension System Type: CE.

Data Normalization: The 'direct method' of measuring the receiving room absorption was used.

Preconditioning: Minimum 24 hours at 70 (F), 55% RH.

Test Results: The results of the tests are given on pages 3 and 4.

The results reported above apply to specific samples submitted for measurement.

No responsibility is assumed for performance of any other specimen.

This report may not be reproduced except in full, without the written approval of the laboratory.

The laboratory's accreditation or any of its test reports in no way constitutes or implies product certification, approval, or endorsement by NVLAP or any agency of the U.S. Government.

Sound Attenuation by Suspended Ceiling

Test: ASTM E 1414 / E1414M-11 / ASTM E 413 - 10

Page 3 of 4

Test Report: NGC6011017

Date: 12/20/2011

Spec. Area [m²]: 12

Source room

Volume [m³]: 41.26

Rm Temp [°C]: 18.0

Humidity [%]: 53

Receiving room

Volume [m³]: 41.26

Rm Temp [°C]: 18.3

Humidity [%]: 54

Ceiling Attenuation Class CAC [dB] = 33

Sum of Unfavorable Deviations [dB]: 31

Maximum Unfavorable Deviation [dB]: 8 at 315 Hz

Frequency	D _{n,c}	L1	L2	d	Corr.	u.Dev.	ΔD _{n,c}
[Hz]	[dB]	[dB]	[dB]	[dB/s]	[dB]	[dB]	
100	15	104.7	93.1	55.4	3.4		
125	19	101.6	84.5	67.5	1.9		2.3
160	23	98.1	76.7	78.8	1.5		2.1
200	27	102.4	77.7	68.1	2.3		1.2
250	22	100.7	80.7	72.9	1.9	4	1.1
315	21	99.0	78.8	80.2	0.8	8	0.8
400	25	98.0	74.2	82.3	1.2	7	0.7
500	28	99.6	72.3	93.9	0.7	5	1.0
630	29	98.5	69.9	95.6	0.4	5	0.5
800	33	97.8	64.9	103.7	0.1	2	0.6
1000	36	98.8	61.9	121.2	-0.9		0.8
1250	39	95.6	56.3	128.4	-0.4		0.7
1600	42	93.3	50.3	136.2	-0.9		0.7
2000	45	92.1	47.6	105.4	0.6		0.5
2500	47	92.9	45.9	101.4	0.0		0.5
3150	46	91.0	43.6	144.9	-1.5		0.6
4000	47	91.8	43.1	145.8	-1.7		0.4
5000	49	91.8	41.5	147.4	-1.4		

D_{n,c} = Normalized Ceiling Attenuation, dB
 L1 = Source Room Level, dB
 L2 = Receiving Room Level, dB
 d = Decay Rate, dB/second
 Δ D_{n,c} = Uncertainty for 95% Confidence Level

The results reported above apply to specific samples submitted for measurement.

No responsibility is assumed for performance of any other specimen.

This report may not be reproduced except in full, without the written approval of the laboratory.

The laboratory's accreditation or any of its test reports in no way constitutes or implies product certification, approval, or endorsement by NVLAP or any agency of the U.S. Government.

Sound Attenuation by Suspended Ceiling

Page 4 of 4

Test: ASTM E 1414 / E1414M-11 / ASTM E 413 - 10

Test Report: NGC6011017

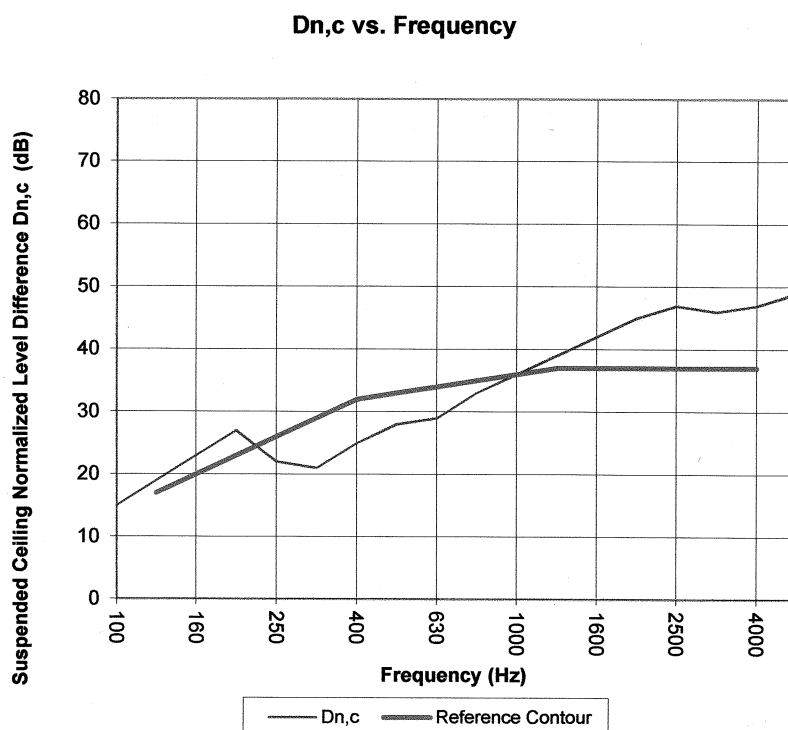
Test Date: 12/20/2011

Specimen Size [m²]: 12

Ceiling Attenuation Class CAC [dB] = 33 dB

Frequency [Hz]	D _{n,c} [dB]	ΔD _{n,c}
100	15	
125	19	2.3
160	23	2.1
200	27	1.2
250	22	1.1
315	21	0.8
400	25	0.7
500	28	1.0
630	29	0.5
800	33	0.6
1000	36	0.8
1250	39	0.7
1600	42	0.7
2000	45	0.5
2500	47	0.5
3150	46	0.6
4000	47	0.4
5000	49	

* Due to high insulating value of specimen, background levels limit results at these frequencies.



D_{n,c} = Normalized Ceiling Attenuation, dB
 Δ D_{n,c} = Uncertainty for 95% Confidence Level

The results reported above apply to specific samples submitted for measurement.

No responsibility is assumed for performance of any other specimen.

This report may not be reproduced except in full, without the written approval of the laboratory.

The laboratory's accreditation or any of its test reports in no way constitutes or implies product certification, approval, or endorsement by NVLAP or any agency of the U.S. Government.



Acoustical Testing Laboratory



Accredited by the National Voluntary
Laboratory Accreditation Program
for the specific scope of accreditation
under Lab Code 200291

TEST REPORT

For

Transwall Office Systems
1220 Wilson Drive
West Chester, PA 19380
Frank Lytle / 484-877-7131

Sound Attenuation of Suspended Ceiling Test

ASTM E 1414/E 1414M - 11 / E 413 - 10

On

**Insulated Mineral Fiber Demountable Ceiling System and Panels;
5/8 Inch x 2 Foot x 2 Foot Panels
With AcoustiCAP Installed on Return Air Grilles**

Report Number: NGC 6011018

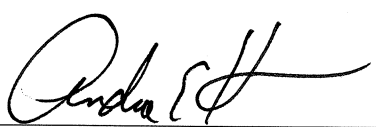
Page 1 of 4

Assignment Number: G- 744

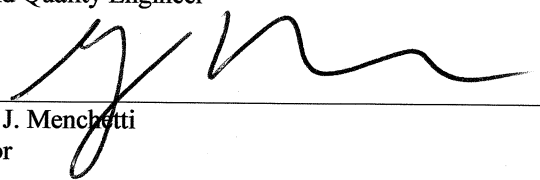
Test Date: 12/21/2011

Report Date: 03/26/2012

Submitted by: _____


Andrew E. Heuer
Test and Quality Engineer

Reviewed by: _____


Robert J. Menchetti
Director

The results reported above apply to specific samples submitted for measurement.

No responsibility is assumed for performance of any other specimen.

This report may not be reproduced except in full, without the written approval of the laboratory.

The laboratory's accreditation or any of its test reports in no way constitutes or implies product certification, approval, or endorsement by NVLAP or any agency of the U.S. Government.

Report Number: NGC 6011018

Test Method: This test method conforms explicitly with the American Society for Testing and Materials Standard Test Method for Airborne Sound Attenuation Between Rooms Sharing a Common Ceiling Plenum. Designation: E 1414/E 1414M - 11 / E 413 - 10

Specimen Designation: A typical 2 foot x 2 foot suspended ceiling grid system was used for this test. Into this grid were mounted nominal 5/8 inch x 2 foot x 2 foot mineral fiber ceiling panels. In addition, one 2 foot by 2 foot panel in each test room was replaced with an HVAC return air grille. The return air grilles were installed the same four to six foot distance from the dividing partition of the two test rooms and directly opposite each other. An AcoustiCAP test unit with backed all natural fiber strips battening was installed onto each return air grille. When the AcoustiCap units were installed onto the return air grilles, they were installed perpendicular to each other. In each test room, a layer of nominal 3-5/8 inch R-11 unfaced fiberglass batts were laid on the ceiling panels two feet adjacent to the dividing partition's cap.

AcoustiCap Description: Each AcoustiCAP unit was observed to be a 23.5 inch (596.9mm) by 31 inch (787.4mm) piece of 0.035 inch (.89mm) thick sheet metal that was bent to form a dome. The height of the dome was nominally 7 inches (177.8mm). A nominal 1-1/2 inch cotton insulation was adhesively adhered to the underside of the metal. Each AcoustiCAP dome weighed 6.9 pounds (3.12 kg.). When installed onto each return air grille, each AcoustiCAP dome sat on two strips of 1-1/2 inch (38.1mm) thick x 21-1/2 inch (546.1mm) long x 6.5 inch (165.1mm) wide cotton battening.

Grid System Description: Suspended ceiling system consisting of nominal 2 foot by 2 foot lay-in mineral fiber ceiling panels. The T-grid system was Chicago Metallic Exposed Tee System. Main tee part number 211.01H. Cross tee part number 209.01H. Tee cross number 229.01H. All mains and tees had a 23.8mm (15/16 in.) wide face.

The specimen was sealed with caulk between the grid face and the top of the dividing partition. The metal grid system was installed continuous at the dividing partition.

Ceiling Panel Description: Ceiling panels were observed to consist of: Nominal 603.2mm x 603.2mm (23-3/4 in. x 23-3/4 in.) Trim Edge Mineral Fiber Lay-in ceiling panels. The panels were 14.6mm (0.573 in.) thick and weighed 3.03 kg/m² (0.62 PSF). These panels had a white painted Front Face that was both Fissured and Perforated. All panels had a Backcoating.

Ceiling Test Area: 26 sq. meters
Suspension System Type: CE.

Data Normalization: The 'direct method' of measuring the receiving room absorption was used.

Preconditioning: Minimum 24 hours at 70 (F), 55% RH.

Test Results: The results of the tests are given on pages 3 and 4.

The results reported above apply to specific samples submitted for measurement.

No responsibility is assumed for performance of any other specimen.

This report may not be reproduced except in full, without the written approval of the laboratory.

The laboratory's accreditation or any of its test reports in no way constitutes or implies product certification, approval, or endorsement by NVLAP or any agency of the U.S. Government.

Sound Attenuation by Suspended Ceiling

Test: ASTM E 1414 / E1414M-11 / ASTM E 413 - 10

Page 3 of 4

Test Report: NGC6011018

Date: 12/21/2011

Spec. Area [m²]: 12

Source room

Volume [m³]: 41.26

Rm Temp [°C]: 18.0

Humidity [%]: 53

Receiving room

Volume [m³]: 41.26

Rm Temp [°C]: 18.0

Humidity [%]: 53

Ceiling Attenuation Class CAC [dB] = 37

Sum of Unfavorable Deviations [dB]: 29

Maximum Unfavorable Deviation [dB]: 8 at 315 Hz

Frequency	D _{n,c}	L1	L2	d	Corr.	u.Dev.	ΔD _{n,c}
[Hz]	[dB]	[dB]	[dB]	[dB/s]	[dB]	[dB]	
100	16	104.3	91.6	52.5	3.3	1	2.3
125	20	101.4	83.3	70.4	1.9		
160	24	97.9	75.9	73.5	2.0		
200	27	102.1	77.0	64.0	1.9	6	1.4
250	24	100.8	78.4	67.7	1.6		
315	25	98.8	75.8	74.1	1.9		
400	29	98.0	70.1	79.4	1.2	7	0.5
500	33	99.7	67.2	89.6	0.6		
630	35	98.4	64.2	93.2	0.8		
800	39	98.0	58.8	104.4	-0.1		0.9
1000	43	98.8	56.0	112.8	0.1		
1250	44	95.7	51.0	125.7	-0.8		
1600	47	92.9	45.1	137.8	-0.8		0.7
2000	49	92.3	42.4	143.0	-1.0		
2500	51	93.1	40.6	149.6	-1.6		
3150	52	91.3	37.9	154.3	-1.3		0.7
4000	52	91.3	38.0	147.1	-1.2		
5000	52	91.7	37.9	149.0	-1.8		

D_{n,c} = Normalized Ceiling Attenuation, dB
 L1 = Source Room Level, dB
 L2 = Receiving Room Level, dB
 d = Decay Rate, dB/second
 Δ D_{n,c} = Uncertainty for 95% Confidence Level

The results reported above apply to specific samples submitted for measurement.

No responsibility is assumed for performance of any other specimen.

This report may not be reproduced except in full, without the written approval of the laboratory.

The laboratory's accreditation or any of its test reports in no way constitutes or implies product certification, approval, or endorsement by NVLAP or any agency of the U.S. Government.

Sound Attenuation by Suspended Ceiling

Page 4 of 4

Test: ASTM E 1414 / E1414M-11 / ASTM E 413 - 10

Test Report: NGC6011018

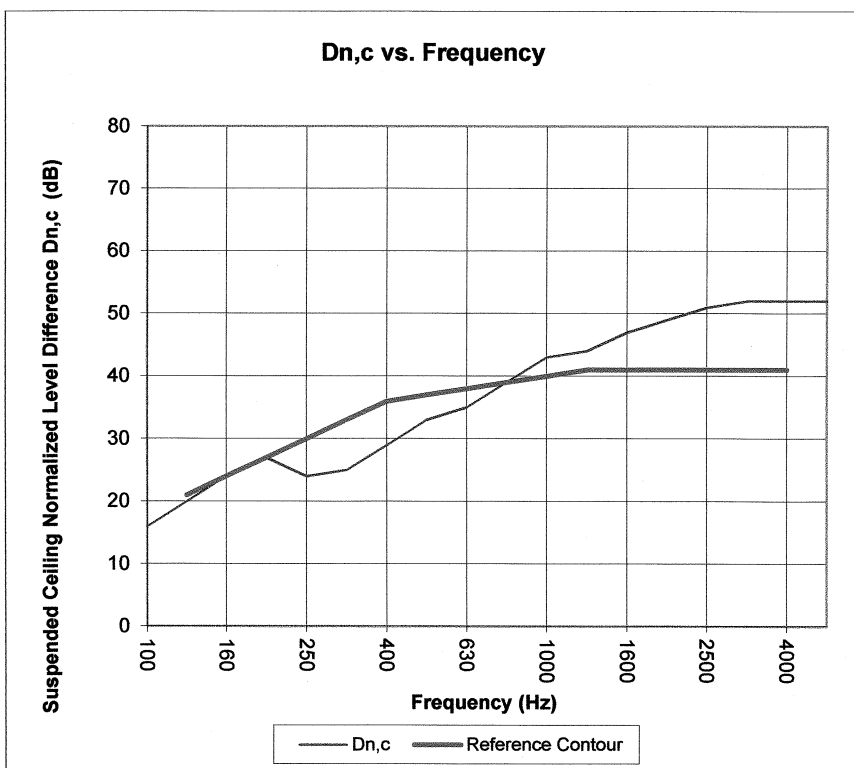
Test Date: 12/21/2011

Specimen Size [m²]: 12

Ceiling Attenuation Class CAC [dB] = 37 dB

Frequency [Hz]	D _{n,c} [dB]	ΔD _{n,c}
100	16	
125	20	2.3
160	24	2.0
200	27	1.4
250	24	1.2
315	25	0.8
400	29	0.5
500	33	1.1
630	35	0.5
800	39	0.9
1000	43	0.7
1250	44	0.8
1600	47	0.7
2000	49	0.6
2500	51	0.4
3150	52	0.7
4000	52	0.7
5000	52	

* Due to high insulating value of specimen, background levels limit results at these frequencies.



D_{n,c} = Normalized Ceiling Attenuation, dB
 Δ D_{n,c} = Uncertainty for 95% Confidence Level

The results reported above apply to specific samples submitted for measurement.

No responsibility is assumed for performance of any other specimen.

This report may not be reproduced except in full, without the written approval of the laboratory.

The laboratory's accreditation or any of its test reports in no way constitutes or implies product certification, approval, or endorsement by NVLAP or any agency of the U.S. Government.