

**D6442.01-113-11-R0**  
**ACOUSTICAL PERFORMANCE TEST REPORT**  
**ASTM E 90 AND ASTM E 492**

**Rendered to**

**PROTECTO WRAP COMPANY**

**Series/Model: Whisper Mat® CS**

**Specimen Type: Sound Control & Crack Suppression Membrane**

**Overall Size: 3023 mm by 3632 mm**

<b>STC</b>	<b>55</b>
<b>IIC</b>	<b>50</b>

**Test Sample Identification:**

Floor Topping: 7.3 mm Porcelain Tile

Underlayment: 2.8 mm Protecto Wrap Whisper Mat® CS

Floor Slab: 152 mm Concrete Slab

Reference should be made to Architectural Testing, Inc. Report D6442.01-113-11 for complete test specimen description.

## Acoustical Performance Test Report

PROTECTO WRAP COMPANY  
1955 South Cherokee Street  
Denver, Colorado 80223

<b>Report</b>	D6442.01-113-11
<b>Test Date</b>	04/03/14
<b>Report Date</b>	04/11/14
<b>Record Retention End Date</b>	04/03/18

### Project Scope

Protecto Wrap Company contracted Architectural Testing to conduct airborne sound transmission loss and impact sound transmission tests. A summary of the results is listed in the Test Results section, and the complete test data is included as attachments to this report. The client provided the test specimen.

### Test Methods

The acoustical tests were conducted in accordance with the following standards. The equipment listed in the attachments meets the requirements of the following standards.

ASTM E 90-09, Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions

ASTM E 413-10, Classification for Rating Sound Insulation

ASTM E 492-09, Standard Test Method for Laboratory Measurement of Impact Sound Transmission Through Floor-Ceiling Assemblies Using the Tapping Machine

ASTM E 989-06 (2012), Classification for Determination of Impact Insulation Class (IIC)

ASTM E 2235-04 (2012) Standard Test Method for Determination of Decay Rates for Use in Sound Insulation Test Methods

### Test Procedure

All testing was conducted in the VT test chambers at Architectural Testing, Inc. located in York, Pennsylvania. The microphones were calibrated before conducting the tests.

The sound transmission loss test was conducted in accordance with the ASTM E 90 test method using a single direction of measurement. Two background noise sound pressure level and twenty-five sound absorption measurements were conducted at each of five microphone positions. Four sound pressure level measurements were made simultaneously in both rooms, at each of five microphone positions.

### Test Procedure (Continued)

The impact sound transmission test was conducted in accordance with the ASTM E 492 test method. Two background noise sound pressure level, two sound pressure level measurements with the tapping machine operating at each position specified by ASTM E 492, and twenty-five sound absorption measurements were conducted at each of five microphone positions.

The air temperature and relative humidity conditions were monitored and recorded during all measurements.

### Test Conditions

Source Room		Receive Room	
Maximum Temperature	19.2 °C	Maximum Temperature	18.4 °C
Minimum Temperature	19.0 °C	Minimum Temperature	18.3 °C
Average Temperature	19.1 °C	Average Temperature	18.3 °C
Maximum Relative Humidity	65%	Maximum Relative Humidity	65%
Minimum Relative Humidity	62%	Minimum Relative Humidity	64%
Average Relative Humidity	63%	Average Relative Humidity	65%

### Test Calculations

The STC (Sound Transmission Class) rating was calculated in accordance with ASTM E 413. The IIC (Impact Insulation Class) rating was calculated in accordance with ASTM E 989.

### Test Specimen Construction

The test specimen was constructed in the 3023 mm long by 3632 mm wide by 457 mm high opening.

The porcelain tiles were set with light pressure into the bed of mortar and separated by 3.18 mm spacers. TEC Fast Setting mortar was mixed as per manufacturer's specifications and troweled on top of the underlayment using a 9.53 mm by 9.53 mm by 9.53 mm square notch trowel. The mortar was allowed to cure according to the manufacturer's specifications. TEC Power Grout was mixed as per manufacturer's specifications and troweled into the 3.18 mm spaces between the porcelain tiles using a grout float. All excess grout was cleaned using a damp sponge. The grout was allowed to cure according to the manufacturer's specifications before testing. The perimeter of the porcelain tile floor was sealed to the test frame with duct seal.

A single layer of 0.05 mm polyethylene sheet was adhered to the Whisper Mat® CS. The polyethylene sheet was adhered to the concrete slab with a fast-drying adhesive.

### Test Specimen Construction (Continued)

The concrete slab was installed onto a perimeter frame within the steel test frame. The perimeter frame was constructed from 2x6 dimensional lumber. The top side of the perimeter frame was covered with one layer of dense neoprene foam (9.5 mm thick by 76.2 mm wide). The perimeter of the concrete slab was sealed to the steel frame with duct seal. Cure time for the concrete slab was more than 28 days.

### Test Specimen Materials

Material	Dimensions (mm)	Thickness (mm)	Manufacturer and Series	Quantity	Average Weight	Total Weight
Porcelain Tile	304.8 by 304.8	7.30	N/A	10.98 m <sup>2</sup>	14.8 kg/m <sup>2</sup>	162.39 kg
Whisper Mat® CS	914.4 by 3023	2.80	Protecto Wrap	10.98 m <sup>2</sup>	2.1 kg/m <sup>2</sup>	23.06 kg
Concrete Slab	3023 by 3632	152.00	N/A	10.98 m <sup>2</sup>	366.2 kg/m <sup>2</sup>	4020.7 kg

### Comments

The total weight of the floor/ceiling assembly was 4206.2 kg. Architectural Testing will store samples of the test specimen for four years. Photographs of the test specimen are included in the attachments. A design drawing is included in the attachments.

Architectural Testing will service this report for the entire test record retention period. Test records, such as detailed drawings, datasheets, representative samples of test specimens, or other pertinent project documentation, will be retained by Architectural Testing for the entire test record retention period.

This report does not constitute certification of this product nor an opinion or endorsement by this laboratory. It is the exclusive property of the client so named herein and relates only to the specimen tested. This report may not be reproduced, except in full, without the written approval of Architectural Testing.


For ARCHITECTURAL TESTING, INC:



Digitally signed by Daniel Mohler

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Daniel B. Mohler  
Technician II - Acoustical Testing



Digitally signed by Bradley D. Hunt

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Bradley D. Hunt  
Project Manager - Acoustical Testing

Attachments (7)

*\* Stated by Client/Manufacturer*

*N/A - Non Applicable*

### Revision Log

<u>Revision</u>	<u>Date</u>	<u>Page(s)</u>	<u>Description</u>
R0	04/11/14	N/A	Original Report Issue

## Attachments

### Instrumentation

Instrument	Manufacturer	Model	ATI Number	Date of Calibration
Data Acquisition Unit	National Instruments	PXI-1033	63763	06/12 *
Source Room Microphone	PCB Piezotronics	378B20	63738	04/13
Source Room Microphone	PCB Piezotronics	378B20	63739	04/13
Source Room Microphone	PCB Piezotronics	378B20	64912	11/13
Source Room Microphone	PCB Piezotronics	378B20	63741	04/13
Source Room Microphone	PCB Piezotronics	378B20	63742	04/13
Receive Room Microphone	PCB Piezotronics	378B20	63748	04/13
Receive Room Microphone	PCB Piezotronics	378B20	63744	04/13
Receive Room Microphone	PCB Piezotronics	378B20	63745	04/13
Receive Room Microphone	PCB Piezotronics	378B20	63746	04/13
Receive Room Microphone	PCB Piezotronics	378B20	63747	04/13
Receive Room Environmental Indicator	Comet	T7510	63810	09/13
Receive Room Environmental Indicator	Comet	T7510	63811	09/13
Source Room Environmental Indicator	Comet	T7510	63812	09/13
Microphone Calibrator	Norsonic	1251	C002919	07/13
Tapping Machine	Norsonic	N-211	Y003242	03/14

\* The calibration frequency for this equipment is every two years per the manufacturer's recommendation.

### Test Chambers

VT Receive Room Volume	158.9 m <sup>3</sup>
VT Source Room Volume	190 m <sup>3</sup>

**SOUND TRANSMISSION LOSS**  
ASTM E 90



Test Date	04/03/14
Data File No.	D6442.01A
Client	Protecto Wrap Company
Description	7.3 mm Porcelain Tile, 2.8 mm Protecto Wrap Whisper Mat® CS, 152 mm Concrete Slab
Specimen Area	10.98 m <sup>2</sup>
Technician	Daniel B. Mohler

Freq (Hz)	Background SPL (dB)	Absorption (m <sup>2</sup> )	Source SPL (dB)	Receive SPL (dB)	Specimen TL (dB)	95% Confidence Limit	Number of Deficiencies
80	62.9	16.5	100	60	39	7.35	-
100	46.0	11.6	97	58	41	4.61	-
125	38.2	9.0	95	58	38	3.09	1
160	35.3	9.4	95	59	37	3.83	5
200	27.0	11.2	94	57	38	3.23	7
250	28.2	10.6	96	52	45	1.35	3
315	25.7	9.7	96	50	47	1.05	4
400	23.0	8.0	93	46	49	1.35	5
500	23.7	7.2	94	43	54	0.70	1
630	25.4	6.8	95	42	56	0.87	0
800	26.3	7.1	94	40	57	1.30	0
1000	24.3	7.1	95	39	58	0.54	0
1250	23.5	7.1	96	37	61	0.67	0
1600	19.4	7.2	95	36	62	0.53	0
2000	11.3	8.0	95	34	64	0.69	0
2500	7.5	8.8	94	32	64	0.62	0
3150	6.0	9.8	94	29	66	0.94	0
4000	5.8	11.2	95	26	69	0.92	0
5000	5.7	13.5	95	23	72	0.84	-
6300	6.1	17.0	88	11	76	1.09	-
8000	6.5	22.4	88	7	79	1.26	-
10000	6.6	28.4	82	5	74	1.08	-

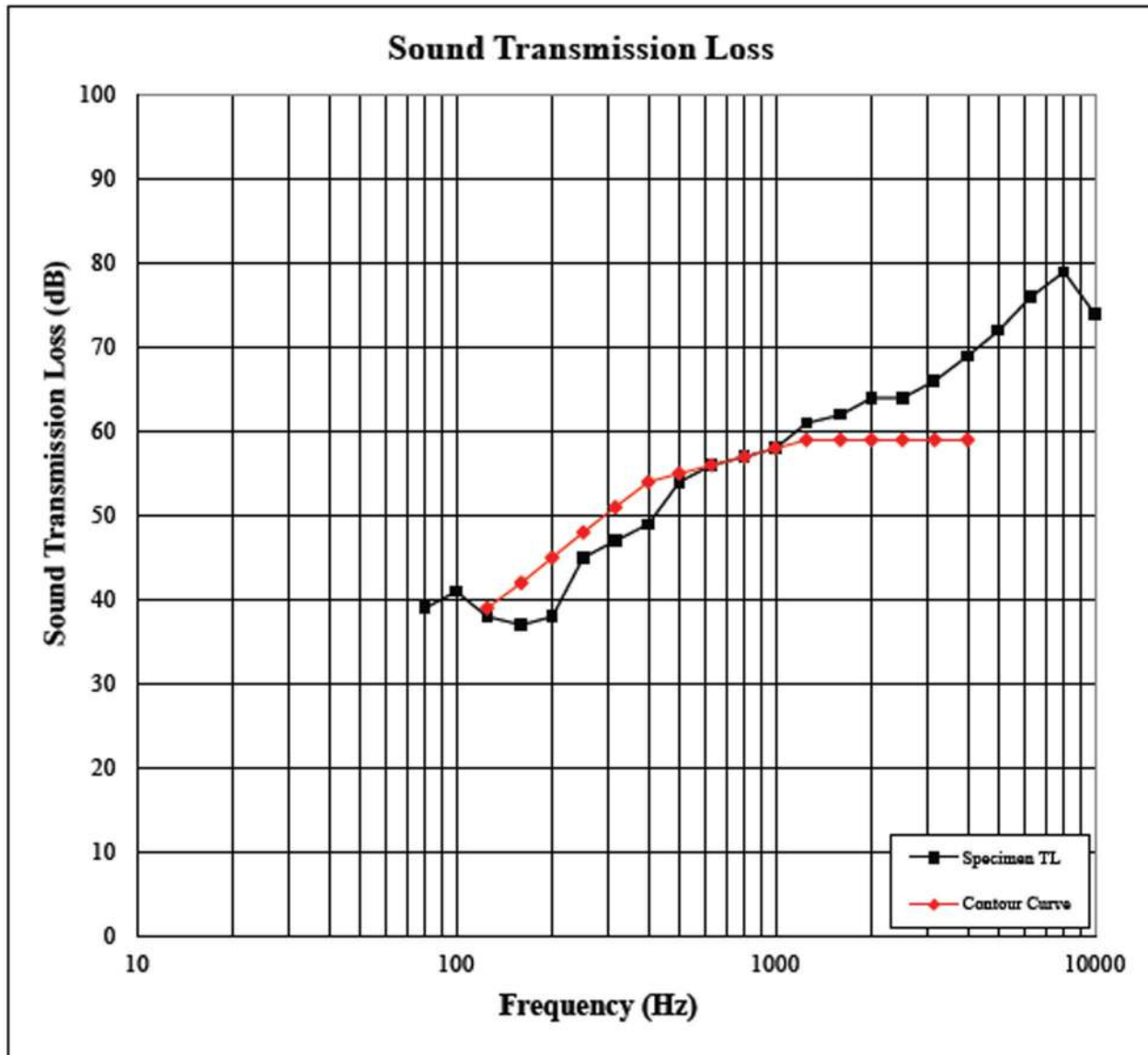
**STC Rating**      **55**      (*Sound Transmission Class*)  
**Deficiencies**    **26**      (*Sum of Deficiencies*)

- Notes:**
- 1) Receive Room levels less than 5 dB above the Background levels are highlighted in yellow.
  - 2) Specimen TL levels listed in red indicate the lower limit of the transmission loss.
  - 3) Specimen TL levels listed in green indicate that there has been a filler wall correction applied

**SOUND TRANSMISSION LOSS**  
ASTM E 90



Test Date	04/03/14
Data File No.	D6442.01A
Client	Protecto Wrap Company
Description	7.3 mm Porcelain Tile, 2.8 mm Protecto Wrap Whisper Mat® CS, 152 mm Concrete Slab
Specimen Area	10.98 m <sup>2</sup>
Technician	Daniel B. Mohler



**IMPACT TRANSMISSION**  
ASTM E 492



Test Date	04/03/14
Data File No.	D6442.01A
Client	Protecto Wrap Company
Description	7.3 mm Porcelain Tile, 2.8 mm Protecto Wrap Whisper Mat® CS, 152 mm Concrete Slab
Specimen Area	10.98 m <sup>2</sup>
Technician	Daniel B. Mohler

Freq (Hz)	Background SPL (dB)	Absorption (m <sup>2</sup> )	Normalized Impact SPL (dB)	95% Confidence Limit	Number of Deficiencies
80	63.8	14.5	65	4.2	-
100	45.2	12.0	58	1.7	0
125	37.8	9.3	59	0.6	0
160	35.8	9.0	62	0.9	0
200	28.6	10.9	68	1.1	6
250	28.4	10.6	66	0.6	4
315	27.6	9.6	64	0.6	2
400	24.1	8.0	64	0.7	3
500	23.9	7.3	63	0.4	3
630	24.5	6.9	62	0.3	3
800	25.6	7.2	64	0.3	6
1000	24.4	7.1	59	1.0	2
1250	22.2	7.1	54	1.0	0
1600	18.1	7.2	52	0.6	1
2000	12.1	8.1	48	0.4	0
2500	7.6	8.8	45	0.9	0
3150	5.8	9.8	44	0.5	2
4000	5.5	11.1	40	0.6	-
5000	5.6	13.5	36	0.4	-
6300	6.0	17.0	34	0.7	-
8000	6.5	22.5	32	0.9	-
10000	6.6	28.3	30	1.2	-

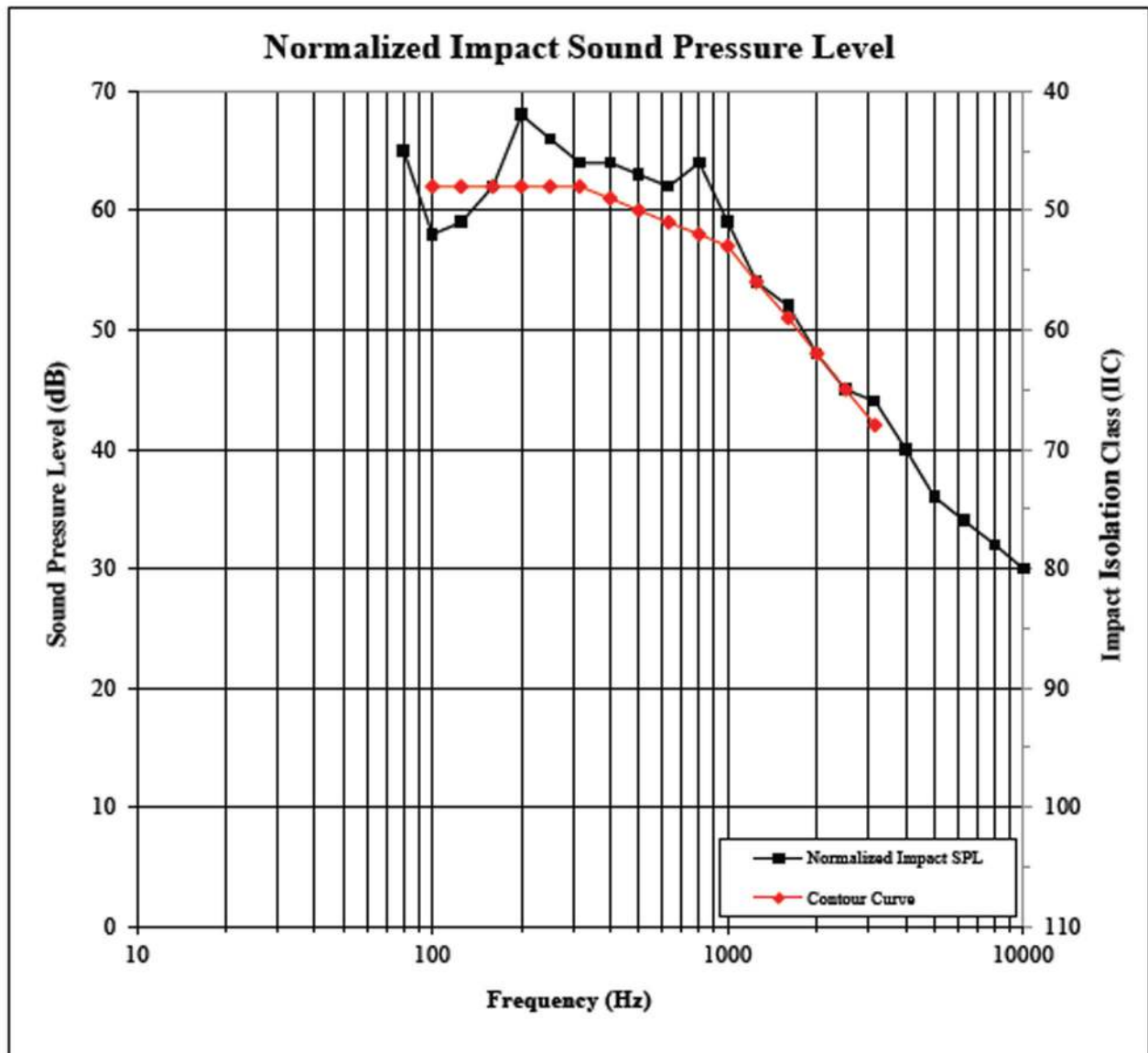
**IIC Rating**      50      (*Impact Insulation Class*)

**Deficiencies**    32      (*Sum of Deficiencies*)

*Note:*      Receive Room levels less than 5 dB above the Background levels are highlighted in yellow.

**IMPACT TRANSMISSION**  
 ASTM E 492

Test Date	04/03/14
Data File No.	D6442.01A
Client	Protecto Wrap Company
Description	7.3 mm Porcelain Tile, 2.8 mm Protecto Wrap Whisper Mat® CS, 152 mm Concrete Slab
Specimen Area	10.98 m <sup>2</sup>
Technician	Daniel B. Mohler



**Photographs**

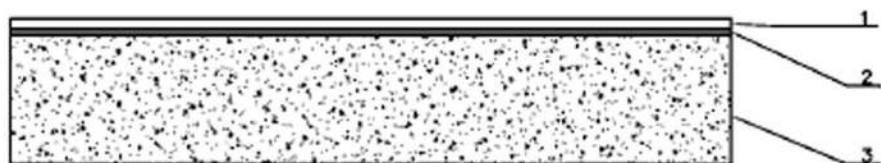


**Source Room View of Test Specimen Installation**



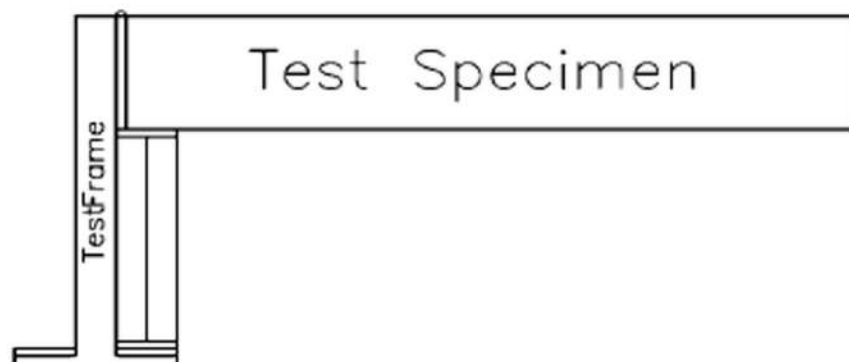
**Receive Room View of Test Specimen Installation**

### Drawings



- 1 - Floor Topping
- 2 - Sound Control & Crack Suppression Membrane
- 3 - Concrete Slab

### Cross Section View of Test Specimen



### Test Specimen Installation