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Order No. 3058029

May 12, 2004

REPORT NO. 3058029-007

**IMPACT SOUND TRANSMISSION TEST
AND CLASSIFICATION OF BRUCE ENGINEERED HARDWOOD FLOORING OVER
REDUPAX UNDERLAYMENT
ON A FLOOR/CEILING ASSEMBLY**

RENDERED TO

**SOUND SEAL
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INTRODUCTION

This report gives the results of an Impact Sound Transmission test on Bruce Engineered Hardwood flooring over Redupax underlayment. The underlayment was selected and supplied by the client and received at the laboratories on April 9, 2004. The sample appeared to be in new, unused condition upon arrival.

AUTHORIZATION

Purchase Order No. 8611 from Sound Seal.

TEST METHOD

The specimen was tested in accordance with the American Society for Testing and Materials designations ASTM E492-90 (Reapproved 1996), "Standard Test Method for Laboratory Measurement of Impact Sound Transmission Through Floor-Ceiling Assemblies Using the Tapping Machine". It was classified in accordance with ASTM E989-89 (Re-approved 1999), entitled, "Standard Classification for Determination of Impact Insulation Class (IIC)".

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

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GENERAL

The method is designed to measure the impact sound transmission performance of a floor-ceiling assembly, in a controlled laboratory environment. A standard tapping machine (B & K Type 3204) was placed at four positions on a test floor that forms the horizontal separation between two rooms, one directly above the other. The data obtained was normalized to a reference room absorption of 10 square meters in accordance with the test method.

The standard also prescribes a single-figure classification rating called “Impact Insulation Class, IIC” which can be used by architects, builders and code authorities for acoustical design purposes in building construction.

The IIC is obtained by matching a standard reference contour to the plotted normalized one-third octave band sound pressure levels at each test frequency. The greater the IIC rating, the lower the impact sound transmission through the floor-ceiling assembly.

DESCRIPTION OF THE FLOOR/CEILING ASSEMBLY

The test floor is a 100 sq. ft. opening that forms the horizontal separation of the two rooms, one directly above the other. The structural members are open webbed wood floor trusses, 16 inches deep installed 24 inches on center. The sub flooring is 5/8 inch thick tongue and groove plywood. The bridging is a continuous 2 x 4 nailed to the bottom chord and the sides of the diagonals with 2 inch long nails. Single leaf RC-1 resilient channels (2 ½ inch x ½ inch) were spaced 16 inches on center and attached to the bottom chord by screws. The insulation is 5 1/2 inches cellulose with a density of 1.6 pcf. The ceiling is gypsum board, 5/8 inches thick, with the long edges located between the joists perpendicular to the resilient channels. Short edges are staggered by 4 ft. Sheets are fastened to the resilient channels by means of 1 1/2 inch screws located 1/2 inch away from the edge and 3 inches from the long edges; screws are spaced 6 inches on center. Joints are taped and finished with two layers of compound.

The topping over the tongue and groove plywood sub-floor is 1 ½ inches of lightweight concrete.



DESCRIPTION OF TEST SPECIMEN**Redupax over wood construction**

Specimen Description: Floating Engineered Hardwood floor covering over Impacta Redupax underlayment installed over wood construction.

The test specimen was a floor-ceiling assembly consisting of the following:

1 layer of Bruce engineered hardwood T & G flooring

1 layer of 9mm (.35") thick Redupax pressed fibrous underlayment panels.

1 layer of 4 mil plastic sheeting

Specimen Size: 12 ½' x 8'

The description of the test specimen was supplied by the client.

RESULTS OF TEST

The data obtained in the room below the panel normalized to $A_o = 10$ square meters, is as follows:

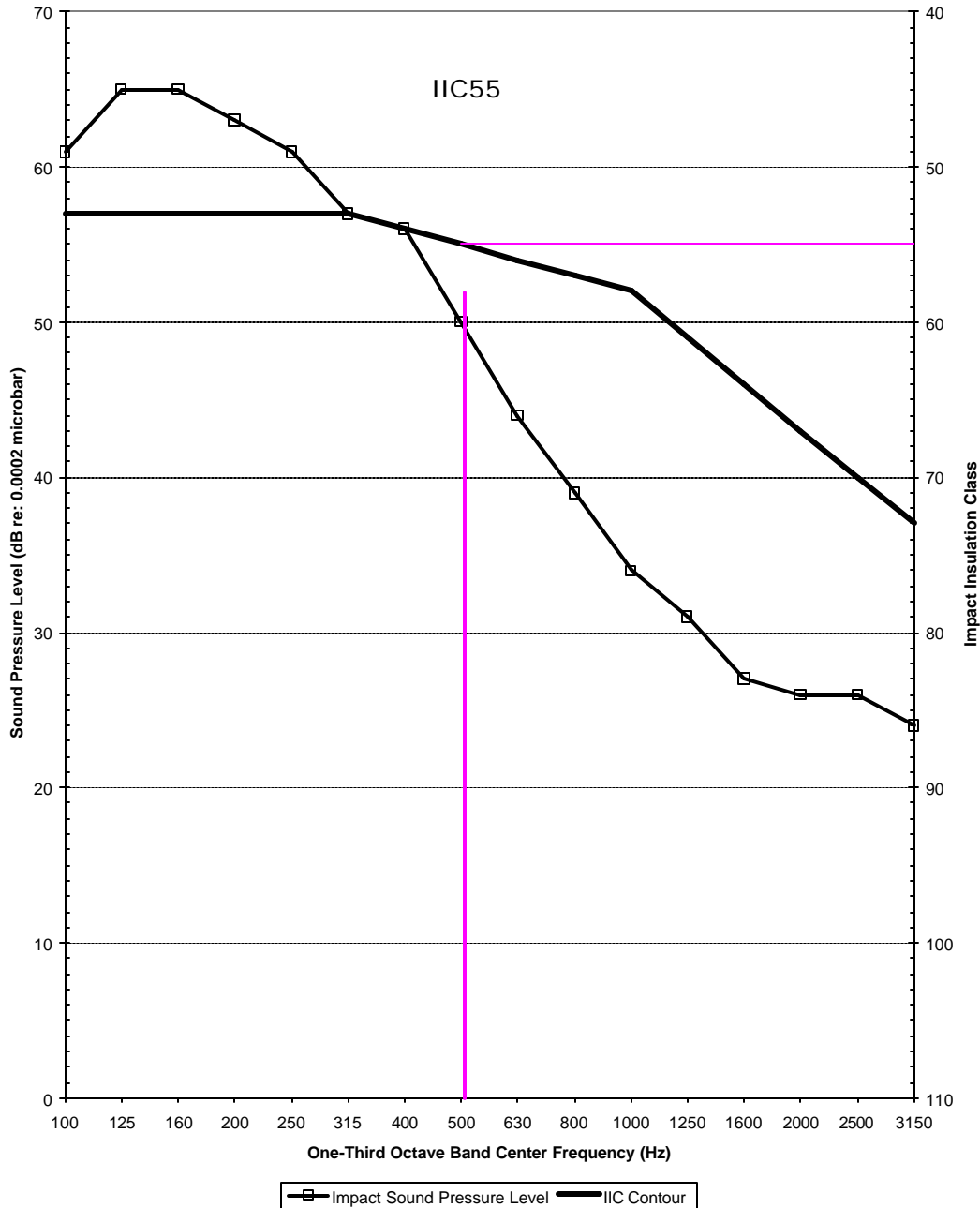
1/3 Octave Band Center Frequency Hz	<u>1/3 Octave Band Sound Pressure Level dB re 0.0002 Microbar</u>
100	61
125	65
160	65
200	63
250	61
315	57
400	56
500	50
630	44
800	39
1000	34
1250	31
1600	27
2000	26
2500	26
3150	24
Impact Insulation Class (IIC)	55

PRECISION

The 95% uncertainty level for each tapping machine location is less than 3 dB for the 1/3 octave bands centered in the range from 100 to 400 Hz and less than 2.5 dB for the bands centered in the range from 500 to 3150 Hz.

**ENGINEERED HARDWOOD FLOORING
OVER REDUPAX UNDERLAYMENT**

Impact Insulation Class



SOUND SEAL



REMARKS

1. Curing Period: None (flooring and underlay)
2. Ambient Temperature: 72 °F
3. Relative Humidity: 36%

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.

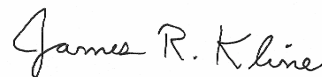
Date of Test: April 12, 2004

Report Approved By:



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