



## REPORT

**Intertek ETL SEMKO**

3933 US ROUTE 11 CORTLAND, NEW YORK 13045

Order No. 3127463

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### **IMPACT SOUND TRANSMISSION TEST AND CLASSIFICATION OF ENGINEERED HARDWOOD FLOORING OVER ISOSTEP 1/4" 1LB VERSION UNDERLAYMENT OVER A WOODJOIST FLOOR/CEILING ASSEMBLY WITH A 1½ INCH THICK LIGHTWEIGHT CONCRETE TOPPING**

#### **TEST METHOD**

The floor system was tested in general accordance with the American Society for Testing and Materials designation ASTM E492-04, "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)".

#### **GENERAL**

The test method is designed to measure the impact sound transmission performance of a floor-ceiling assembly, in a controlled laboratory environment. A standard tapping machine (Bruel & Kjaer Type 3207) 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 purpose 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 (2½ inch x ½ inch) were spaced 16 inches on center and attached to the bottom chord by screws. The insulation is 5½ 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 1½ inch screws located ½ 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 1½ inches of lightweight concrete.

#### **DESCRIPTION OF TEST SPECIMEN**

The test specimen consisted of 3/8 inch thick Engineered Hardwood Flooring over Isostep 1/4" thick recycled rubber underlayment laid on the concrete floor.

## RESULTS OF TEST

The data obtained in the room below the panel normalized to A0 = 10 square meters, is as follows:

1/3 Octave Band Center Frequency Hertz	1/3 Octave Band Sound Pressure Level dB re 0.0002 Microbar
100	63
125	59
160	58
200	61
250	57
315	54
400	55
500	53
630	48
800	42
1000	33
1250	28
1600	27
2000	27
2500	28
3150	22
Impact Insulation Class (IIC)	57

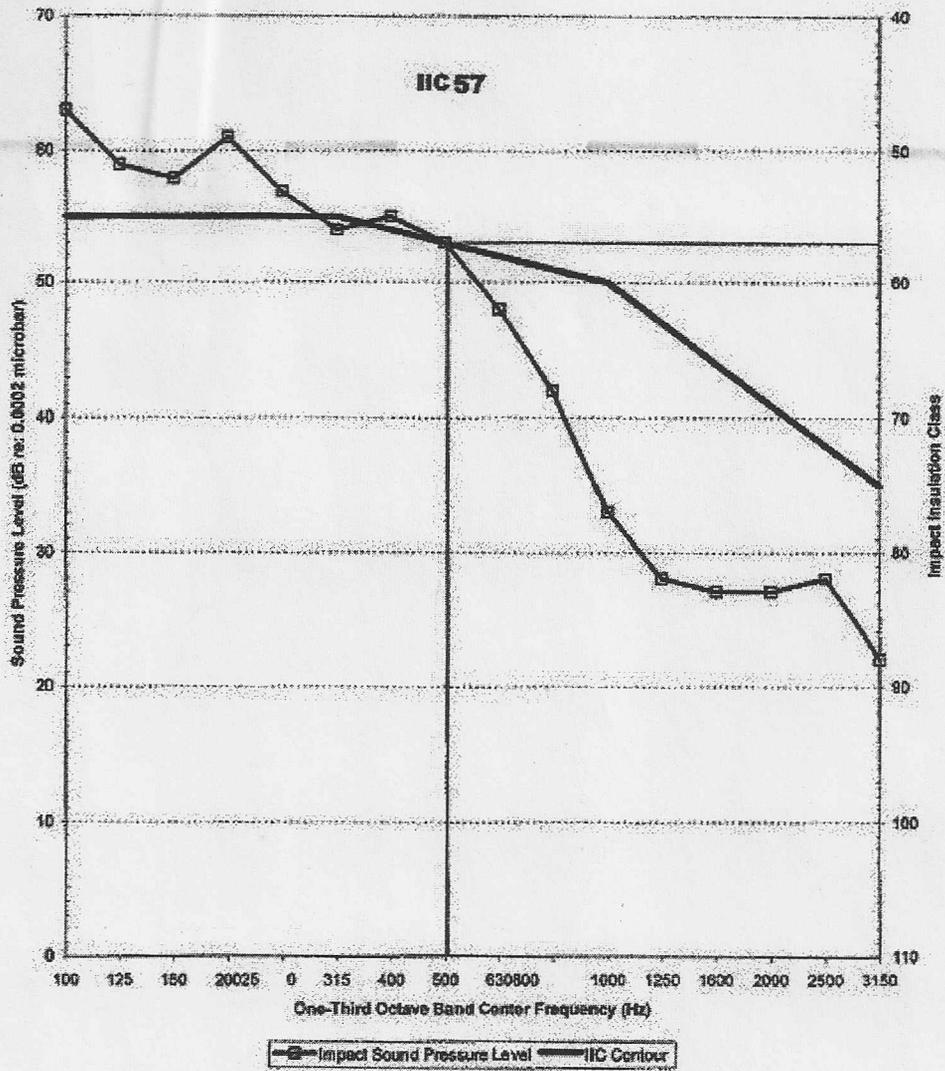
## PRECISION

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.

For the floor/ceiling construction, the 95% uncertainty limits (DLn) for the normalized sound pressure levels were determined to be less than 2 dB for the 1/3 octave bands centered in the range from 100 to 3150 Hz.

**ENGINEERED HARDWOOD FLOORING OVER  
1/4" THICK ISOSTEP UNDERLAYMENT INSTALLED OVER A  
WOOD JOIST FLOOR/CEILING ASSEMBLY WITH A 1 1/2 INCH THICK LIGHTWIEGHT CONCRETE TOPPING**

Impact Insulation Class



REMARKS

1. Curing Period: None
2. Ambient Temperature: 75°F
3. Relative Humidity: 47%

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.

Date of Test: July 26, 2007

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