

June 30<sup>th</sup>, 2011

VIA EMAIL: [jwerner@bjetinc.com](mailto:jwerner@bjetinc.com)

B-JET Products Inc.  
5420 Hwy 6 North, Suite 319  
Toronto, Ontario  
N1H 6J2  
519-622-0943

**Attention:** Jeff Werner

**Re: B-JET Products Inc. – Tyroc Sub-floor,  
Field Impact Sound Insulation Class Testing**

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Dear Jeff;

As requested by B-JET Products Inc., HGC Engineering performed acoustical field impact insulation class tests of several mock-up floor system samples on June 20, 2011, in a high-rise condominium. The primary purpose of this investigation was to evaluate the performance of the Tyroc sub-floor on its own, and with several finished floors above. Sections of flooring were set up in one suite, and measurements were taken in the suite below.

### **Description of Spaces**

The demising floor assembly in the building consists of a nominal 8” poured concrete slab, with no drop ceiling below (stucco finish on the underside of the slab).

There was no flooring installed in the source or receiver rooms except for the test sections. Walls in both source and receiver rooms were generally finished with drywall. Neither source nor receiver rooms were furnished.

### Description of Test Sections

Three floor assemblies were tested (4’ x 4’ test sections) in addition to a test done on the bare concrete. The first floor assembly was a Tyroc subfloor with 300 mm x 300 mm x 8 mm Elaine porcelain tiles above, installed using MAPEI- Ker 121 Polymer-Modified Mortar and grouted using Polymer-Modified Sanded Grout. The second consisted of a Tyroc subfloor with no finished floor covering. The third was a Tyroc subfloor with 10 mm KAINDL laminate flooring above, floated with a 2.4 mm Unison 2-in-1 foam underlayment. The Tyroc subfloor panels were fastened together using LePage PL-Premium adhesive.

**Field Impact Insulation Test Methodology**

Standardized field impact insulation testing was conducted pursuant to the methodologies described by ASTM E-1007, “*Standard Test Method for Field Measurement of Tapping Machine Impact Sound Transmission Through Floor-Ceiling Assemblies and Associated Support Structures*”, subject to limitations of the facility and test sections, as described below. A test of the bare concrete slab was also performed for comparison.

For each test, a standard tapping machine (Norsonic Nor-211A, S/N 29651) was placed on the test section in the source room, in four different orientations per the standard. The resulting average sound pressure levels were measured using a sound level analyzer (Larson Davis 831) in the room directly below. Measurements were also taken to determine the ambient sound in the receiver room and reverberation times. The reverberation times and the room geometry were used to determine the acoustical absorption present in the receiver room. This information was then used to calculate the FIIC (Field Impact Sound Insulation Class) of each test section, according to ASTM E-989, “*Standard Classification for Determination of Impact Insulation Class*”.

**Test Results**

The results of the testing are summarized in Table 1 below.

**Table 1: FIIC Test Results**

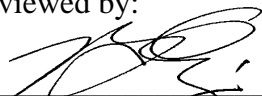
Test Description	FIIC Test Result
Test 1: Ceramic Tiles on Tyroc subfloor	52
Test 2: Bare Tyroc subfloor	58
Test 3: Laminate flooring on foam underlayment and Tyroc subfloor	52
Test 4: Bare Concrete	28

We trust that this information is sufficient for your purposes. Please let us know if you have any questions or require any further input

Best regards,

**Howe Gastmeier Chapnik Limited**

  
\_\_\_\_\_  
Victor Garcia, BAsC

Reviewed by:  
  
\_\_\_\_\_  
Brian Chapnik, (PhD) PEng

Attach: (4)

# **Appendix A**

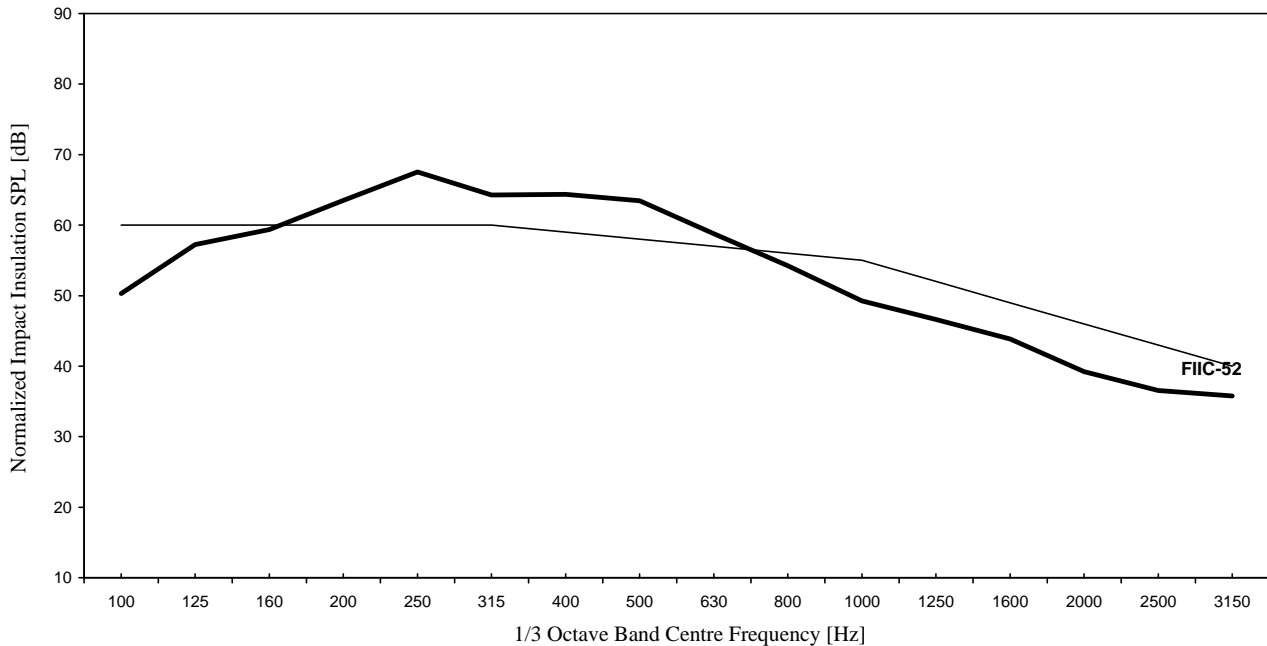
## Field Impact Insulation Class Test Report

<b>B-JET Products Inc</b>	Test : Elaine porcelain tiles on Tyroc subfloor
	Conducted by: JT/VG
	on: 20-Jun-11

Item	1/3 Octave Band Centre Frequency [Hz]																
	100	125	160	200	250	315	400	500	630	800	1000	1250	1600	2000	2500	3150	
Room Volume Limited?	*	*															
Position 1 SPL [dB]	48.5	57.9	61.8	65.9	68.6	66.8	66.4	66.3	64.0	58.4	53.6	50.2	47.4	41.3	38.7	37.8	
Position 2 SPL [dB]	49.7	57.2	61.2	65.1	69.8	67.1	65.6	63.5	59.8	55.9	49.6	46.9	44.4	40.2	37.7	38.0	
Position 3 SPL [dB]	52.8	54.6	57.4	60.0	64.9	65.4	67.4	64.5	59.8	53.3	47.4	45.7	43.2	39.5	36.1	34.0	
Position 4 SPL [dB]	46.1	55.9	60.0	64.5	71.0	67.0	67.9	68.1	60.1	57.9	53.0	49.6	46.4	41.8	39.1	38.2	
Average SPL [dB]	50.0	56.6	60.4	64.4	69.1	66.6	66.9	66.0	61.3	56.8	51.6	48.5	45.6	40.8	38.1	37.3	
Average Ambient SPL [dB]	40.8	40.7	39.2	42.1	35.7	36.6	32.4	26.9	26.2	23.2	23.7	22.0	19.7	19.5	18.3	15.8	
Receiver Room reverberation time [s]	0.6	0.5	0.8	0.8	0.9	1.1	1.1	1.1	1.1	1.1	1.1	1.0	1.0	0.9	0.9	0.9	
Absorption Normalization Factor [dB]	-0.4	-0.7	1.0	0.9	1.5	2.4	2.6	2.5	2.6	2.5	2.3	1.9	1.8	1.6	1.5	1.5	
<b>Normalized Impact Insulation SPL [dB]</b>	<b>50.3</b>	<b>57.3</b>	<b>59.4</b>	<b>63.5</b>	<b>67.6</b>	<b>64.2</b>	<b>64.3</b>	<b>63.5</b>	<b>58.8</b>	<b>54.3</b>	<b>49.2</b>	<b>46.6</b>	<b>43.9</b>	<b>39.2</b>	<b>36.6</b>	<b>35.8</b>	
Impact Insulation SPL of IIC Curve	60	60	60	60	60	60	59	58	57	56	55	52	49	46	43	40	
Delta	0	0	0	4	8	4	5	5	2								

<b>Measured Field IIC =</b>	<b>52</b>
Maximum delta	8
Sum of deltas	28

## Field Impact Insulation Class Test Report



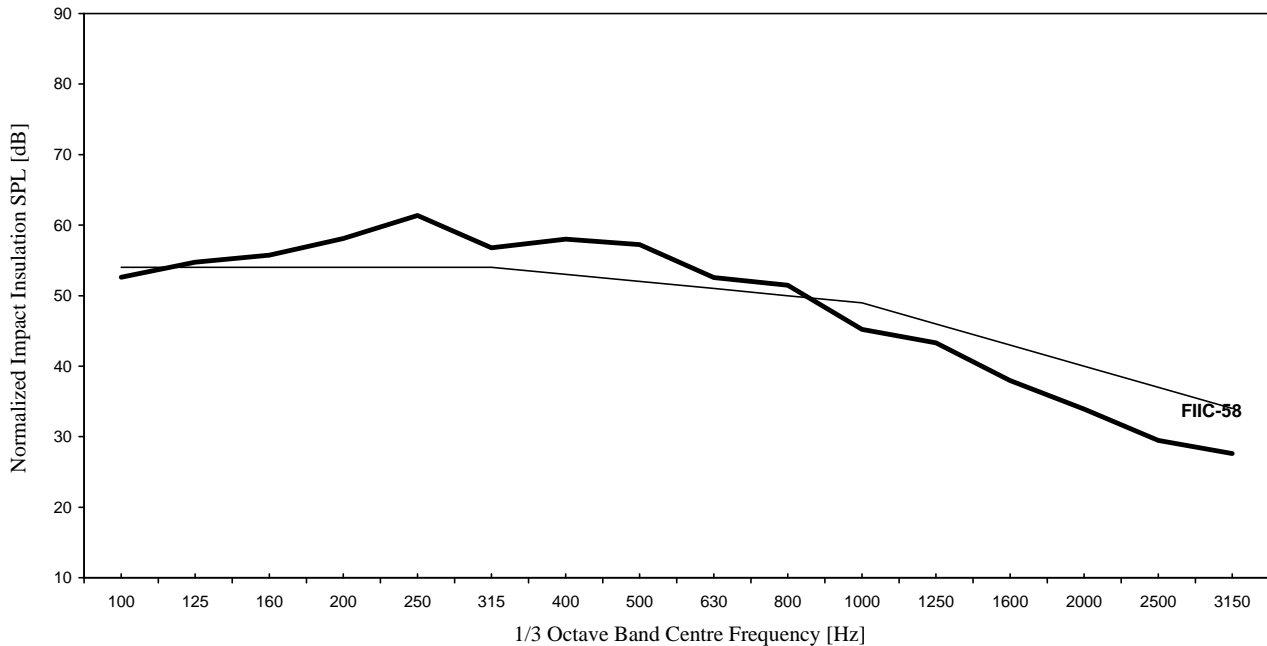
## Field Impact Insulation Class Test Report

<b>B-JET Products Inc</b>	Test : Bare Tyroc subfloor
	Conducted by: JT/VG
	on: 20-Jun-11

Item	1/3 Octave Band Centre Frequency [Hz]															
	100	125	160	200	250	315	400	500	630	800	1000	1250	1600	2000	2500	3150
Room Volume Limited?	*	*														
Position 1 SPL [dB]	52.5	53.8	54.7	57.1	60.8	57.3	60.2	61.9	53.1	43.4	36.7	32.5	32.2	28.0	27.1	26.3
Position 2 SPL [dB]	51.9	52.2	56.0	59.7	63.0	59.4	60.2	56.1	52.9	47.0	39.3	35.2	32.4	30.3	30.0	28.6
Position 3 SPL [dB]	54.5	56.6	59.8	61.3	66.0	61.6	62.3	60.9	59.1	59.5	53.2	50.9	45.2	40.5	33.7	31.1
Position 4 SPL [dB]	47.5	52.0	54.0	55.5	57.7	56.5	58.9	57.8	50.3	46.8	38.9	36.4	32.0	31.2	30.5	29.0
Average SPL [dB]	52.3	54.1	56.8	59.0	62.9	59.1	60.6	59.7	55.2	54.0	47.5	45.2	39.8	35.5	31.0	29.1
Average Ambient SPL [dB]	40.8	40.7	39.2	42.1	35.7	36.6	32.4	26.9	26.2	23.2	23.7	22.0	19.7	19.5	18.3	15.8
Receiver Room reverberation time [s]	0.6	0.5	0.8	0.8	0.9	1.1	1.1	1.1	1.1	1.1	1.1	1.0	1.0	0.9	0.9	0.9
Absorption Normalization Factor [dB]	-0.4	-0.7	1.0	0.9	1.5	2.4	2.6	2.5	2.6	2.5	2.3	1.9	1.8	1.6	1.5	1.5
<b>Normalized Impact Insulation SPL [dB]</b>	52.6	54.7	55.8	58.1	61.4	56.8	58.0	57.2	52.6	51.5	45.2	43.3	38.0	33.9	29.5	27.6
Impact Insulation SPL of IIC Curve	54	54	54	54	54	54	53	52	51	50	49	46	43	40	37	34
Delta	0	1	2	4	7	3	5	5	2	1						

<b>Measured Field IIC =</b>	<b>58</b>
Maximum delta	7
Sum of deltas	30

## Field Impact Insulation Class Test Report



## Field Impact Insulation Class Test Report

**B-JET Products Inc**

Test : KAINDL laminate flooring

on Unison foam, on Tyroc

Conducted by: JT/VG

on: 20-Jun-11

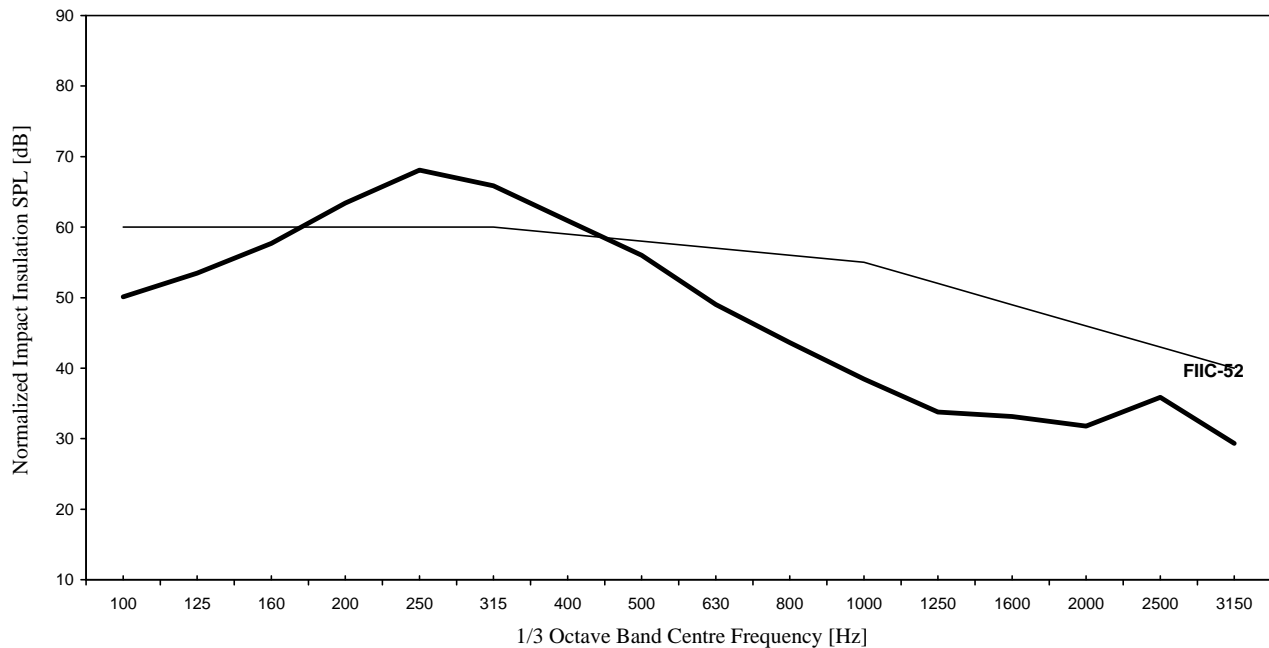
Item	1/3 Octave Band Centre Frequency [Hz]															
	100	125	160	200	250	315	400	500	630	800	1000	1250	1600	2000	2500	3150
Room Volume Limited?	*	*														
Position 1 SPL [dB]	50.1	53.4	60.2	66.6	72.4	71.5	66.9	61.2	53.2	45.9	40.5	32.4	31.3	25.2	25.1	24.6
Position 2 SPL [dB]	50.8	54.6	60.5	63.7	69.0	66.7	62.8	58.1	49.8	44.7	39.0	38.7	39.0	38.8	43.2	36.0
Position 3 SPL [dB]	44.9	47.2	51.1	57.5	61.1	57.8	55.5	52.3	48.3	45.2	40.2	35.1	31.7	25.2	22.4	23.3
Position 4 SPL [dB]	51.0	53.0	58.3	65.1	70.1	68.6	62.5	58.5	53.1	47.9	42.6	33.8	32.3	25.4	25.7	25.4
Average SPL [dB]	49.8	52.8	58.7	64.3	69.6	68.3	63.5	58.5	51.6	46.1	40.8	35.7	35.0	33.3	37.3	30.9
Average Ambient SPL [dB]	40.8	40.7	39.2	42.1	35.7	36.6	32.4	26.9	26.2	23.2	23.7	22.0	19.7	19.5	18.3	15.8
Receiver Room reverberation time [s]	0.6	0.5	0.8	0.8	0.9	1.1	1.1	1.1	1.1	1.1	1.1	1.0	1.0	0.9	0.9	0.9
Absorption Normalization Factor [dB]	-0.4	-0.7	1.0	0.9	1.5	2.4	2.6	2.5	2.6	2.5	2.3	1.9	1.8	1.6	1.5	1.5
<b>Normalized Impact Insulation SPL [dB]</b>	50.1	53.5	57.7	63.4	68.1	65.9	60.9	56.0	49.0	43.6	38.5	33.8	33.2	31.8	35.9	29.3
Impact Insulation SPL of IIC Curve	60	60	60	60	60	60	59	58	57	56	55	52	49	46	43	40
Delta	0	0	0	3	8	6	2									

**Measured Field IIC = 52**

Maximum delta 8

Sum of deltas 19

## Field Impact Insulation Class Test Report



## Field Impact Insulation Class Test Report

<b>B-JET Products Inc</b>	Test : Bare concrete
	Conducted by: JT/VG
	on: 20-Jun-11

Item	1/3 Octave Band Centre Frequency [Hz]																
	100	125	160	200	250	315	400	500	630	800	1000	1250	1600	2000	2500	3150	
Room Volume Limited?	*	*															
Position 1 SPL [dB]	54.2	59.4	61.4	62.2	64.7	65.5	68.2	67.7	68.5	69.0	68.0	68.2	68.2	70.0	71.5	72.7	
Position 2 SPL [dB]	54.7	60.6	63.0	62.2	66.9	65.1	67.3	67.1	68.9	68.6	68.4	69.2	68.8	69.7	71.6	72.8	
Position 3 SPL [dB]	55.7	60.2	63.6	62.8	66.4	66.7	66.4	66.9	67.5	67.9	68.6	68.3	69.2	70.0	70.7	72.6	
Position 4 SPL [dB]	56.5	58.6	61.5	64.1	67.7	65.6	66.6	66.9	67.7	68.5	67.8	68.2	69.1	69.0	72.5	74.2	
Average SPL [dB]	55.4	59.8	62.5	62.9	66.6	65.7	67.2	67.2	68.2	68.5	68.2	68.5	68.8	69.7	71.6	73.1	
Average Ambient SPL [dB]	40.8	40.7	39.2	42.1	35.7	36.6	32.4	26.9	26.2	23.2	23.7	22.0	19.7	19.5	18.3	15.8	
Receiver Room reverberation time [s]	0.6	0.5	0.8	0.8	0.9	1.1	1.1	1.1	1.1	1.1	1.1	1.0	1.0	0.9	0.9	0.9	
Absorption Normalization Factor [dB]	-0.4	-0.7	1.0	0.9	1.5	2.4	2.6	2.5	2.6	2.5	2.3	1.9	1.8	1.6	1.5	1.5	
<b>Normalized Impact Insulation SPL [dB]</b>	<b>55.7</b>	<b>60.4</b>	<b>61.5</b>	<b>62.0</b>	<b>65.0</b>	<b>63.4</b>	<b>64.6</b>	<b>64.7</b>	<b>65.6</b>	<b>66.0</b>	<b>65.9</b>	<b>66.6</b>	<b>67.0</b>	<b>68.1</b>	<b>70.1</b>	<b>71.6</b>	
Impact Insulation SPL of IIC Curve	84	84	84	84	84	84	83	82	81	80	79	76	73	70	67	64	
Delta	0	0	0													3	8

<b>Measured Field IIC = 28</b>
Maximum delta 8
Sum of deltas 11

## Field Impact Insulation Class Test Report

