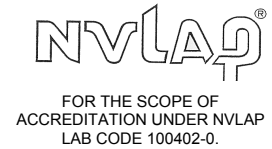




# REPORT



3933 US ROUTE 11 CORTLAND, NEW YORK 13045

Order No. 100323251

Date: March 14, 2011

REPORT NO. 100323251CRT-001

## SILENCER INSERTION LOSS WITH AND WITHOUT AIRFLOW AND AIRFLOW GENERATED SOUND TESTS ON A 2 FOOT LONG 24x24 INCH SILENCER

RENDERED TO

FAISAL JASSIM TRADING CO LLC  
PO BOX 1871  
DUBAI

### INTRODUCTION

This report gives the Insertion Loss in dB and generated sound power level ( $L_w$ ) dB re  $10^{-12}$  watt in relation to a given airflow in fpm on a 2 foot long 24x24 inch silencer. The silencer was selected and supplied by the client and was received at the laboratories on February 14, 2011. The silencer appeared to be in new, unused condition upon arrival.

### AUTHORIZATION

Signed Intertek Quotation No. 500271923.

### TEST METHOD

The laboratory method used in conducting these tests is in accordance with ASTM Standard E477-06a, entitled "Standard Method of Testing Duct Liner Materials and Prefabricated Silencers for Acoustical and Airflow Performance".

Sound pressure level data was obtained using a Bruel and Kjaer Digital Frequency Analyzer Type 2131 and the data analysis was completed using a Compaq ProLinea 4/33 Computer and Epson LQ-850 Printer. The reference sound source used to obtain the generated sound power level was a calibrated Bruel & Kjaer Type 4204, which conforms to the above standard.

**Note:** *The results contained herein are for technical evaluation only and are applicable only to the specific specimens referenced herein.*

*The tests herein reported have not been performed at the request of AMCA International and is not part of the AMCA International Certification Program*

## **TEST METHOD** - Cont'd

The Intertek 16,640 cu. ft. (470 cubic meters) reverberation room is qualified in accordance with ANSI S12.31 and S12.32 for sound measurement from 100 to 10,000 hertz.

The following notes relate to the data submitted in the data pages.

Note: Sound power level data denoted with an asterisk has reached ambient levels in the test room or is determined by instrument limitations. Actual levels are less than or equal to the levels indicated. The generated sound data has been corrected for end reflection.

Note: Insertion loss data denoted with a (>) sign has been corrected to take into consideration the effect of the generated sound pressure level approaching the sound pressure level obtained during the insertion loss portion of the test. In some cases, the insertion loss may be higher than shown.

## **DESCRIPTION OF TEST SPECIMEN**

### **2 FOOT LONG 24x24 INCH SILENCER**

The sample was a 24 inch long silencer which measured 24 inches wide by 24 inches high with two side absorbers and one center absorber. The absorbers were filled. The silencer casing was constructed from galvanized solid steel and the absorbers consisted of perforated galvanized steel with 3/32 inch diameter holes spaced on 3/16 inch staggered centers. The side baffles were 5 3/4 inches thick and the center baffle was 4 1/2 inches thick at the solid rounded entrance. The baffles continued straight to a squared exit. The silencer had an open area of 33% at the inlet and exit. The silencer weighed 76.5 pounds.



FOR THE SCOPE OF  
ACCREDITATION UNDER NVLAP  
LAB CODE 100402-0.

## RESULTS OF MEASUREMENTS

### 2 FOOT LONG 24x24 INCH SILENCER FORWARD FLOW

Frequency	Insertion Loss				Generated Sound Power			
	0 Flow	Flow 1	Flow 2	Flow 3	Flow 1	Flow 2	Flow 3	
	750	1500	2000		750	1500	2000	
63	1	0	1	0	63	56 **	72	74
125	5	5	5	5	125	50	66	75
250	9	9	9	8	250	47	61	70
500	17	16	16	15	500	49	60	67
1000	19	18	18	17	1000	49	61	67
2000	17	17	17	17	2000	46	62	68
4000	15	14	14	14	4000	39	60	68
8000	12	12	12	12	8000	27 **	53	62

Frequency	Insertion Loss				Generated Sound Power			
	0 Flow	Flow 1	Flow 2	Flow 3	Flow 1	Flow 2	Flow 3	
	750	1500	2000		750	1500	2000	
50	0	-1	1	-1	50	53 **	61	70
63	0	-1	0	-1	63	50 **	71	67
80	3	3	4	3	80	48 *	65	69
100	4	4	5	4	100	46	59	74
125	5	4	5	4	125	46	64	67
160	7	7	7	6	160	43	58	65
200	7	8	8	7	200	43	57	68
250	9	9	9	8	250	42	55	62
315	11	11	11	10	315	42	56	64
400	15	14	14	13	400	44	56	63
500	17	17	16	16	500	45	56	62
630	19	19	18	17	630	44	55	62
800	20	19	18	17	800	43	56	61
1000	19	19	18	18	1000	44	57	62
1250	18	17	17	16	1250	44	57	63
1600	19	18	18	17	1600	42	57	63
2000	17	17	16	16	2000	41	57	63
2500	16	16	16	16	2500	40	58	65
3150	16	16	16	15	3150	37	57	64
4000	15	15	15	15	4000	33	55	63
5000	13	13	13	13	5000	29	53	62
6300	13	13	12	12	6300	25 *	50	59
8000	12	12	12	12	8000	21 *	47	56
10000	12	12	12	12	10000	21 **	44	54

Flow	FPM	Static Pressure
1	750	0.25 iwg
2	1500	0.95 iwg
3	2000	1.66 iwg

Sound power levels are in dB referenced  $10^{-12}$  Watts.

The Insertion Loss (IL) is in dB.

The Face Velocity is in fpm.



FOR THE SCOPE OF  
ACCREDITATION UNDER NVLAP  
LAB CODE 100402-0.

**RESULTS OF MEASUREMENTS** (cont'd)

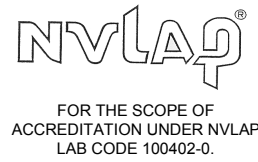
**2 FOOT LONG 24x24 INCH SILENCER REVERSE FLOW**

Frequency	Insertion Loss					Generated Sound Power			
	0 Flow	Flow 1	Flow 2	Flow 3		Flow 1	Flow 2	Flow 3	
	750	1500	2000		750	1500	2000		
63	1	2	2	3	63	58 *	76	82	
125	5	6	6	7	125	52	69	80	
250	10	11	11	12	250	50	63	67	
500	17	18	18	18	500	51	64	68	
1000	19	19	19	19	1000	48	65	69	
2000	18	18	18	18	2000	41	64	69	
4000	15	16	15	15	4000	34 *	59	69	
8000	13	13	13	13	8000	25 **	50	59	

Frequency	Insertion Loss					Generated Sound Power			
	0 Flow	Flow 1	Flow 2	Flow 3		Flow 1	Flow 2	Flow 3	
	750	1500	2000		750	1500	2000		
50	1	1	2	3	50	56 *	67	71	
63	0	1	0	1	63	54 *	75	69	
80	4	4	3	4	80	47 *	64	81	
100	4	5	5	5	100	48	64	80	
125	5	6	6	6	125	49	67	67	
160	8	9	8	10	160	45	58	66	
200	9	9	10	10	200	46	58	63	
250	9	10	11	11	250	44	57	61	
315	12	13	13	14	315	46	59	62	
400	15	16	16	17	400	46	60	62	
500	17	18	18	18	500	46	60	63	
630	20	20	21	22	630	45	59	63	
800	20	20	21	21	800	45	59	64	
1000	19	19	19	19	1000	44	60	64	
1250	18	18	19	18	1250	41	60	65	
1600	19	20	20	20	1600	38	59	63	
2000	18	18	19	19	2000	36	60	64	
2500	17	16	17	17	2500	34	60	66	
3150	16	16	16	16	3150	32	57	66	
4000	15	16	15	15	4000	28	53	64	
5000	14	15	14	14	5000	24 *	50	61	
6300	13	14	14	14	6300	21 *	47	57	
8000	13	12	12	12	8000	20 **	44	54	
10000	13	13	13	13	10000	21 **	41	52	

Flow	FPM	Static Pressure
1	750	0.25 iwg
2	1500	0.95 iwg
3	2000	1.66 iwg

Sound power levels are in dB referenced  $10^{-12}$  Watts.  
The Insertion Loss (IL) is in dB.  
The Face Velocity is in fpm.



**REMARKS**

Ambient Temperature: 69° F  
Relative Humidity: 19%  
Barometric Pressure: 29.42 in. Hg

**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 Tests: March 11, 2011

Report Approved by:

Brian Cyr  
Engineer  
Acoustical Testing

Report Reviewed By:

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Engineer/Quality Supervisor  
Acoustical Testing

Attachments: None