



**AIR MOVEMENT AND CONTROL
ASSOCIATION INTERNATIONAL, INC.**

International Headquarters
30 West University Drive
Arlington Heights, Illinois
60004-1893 USA

Phone: 847-394-0150
Fax: 847-253-0088
E-Mail: jparent@amca.org
Website: www.amca.org

Test No. 28023-S1

November 04, 2011

TO: Aireng Company
Plot # 08, SECTOR I-11/4
Industrial Area
Islamabad, Punjab PAKISTAN 44000

ATTN: Ahmed Saeed
saeed@airengindustries.com

**SUBJECT: CONTRACT TESTING
MODEL No. 15**

Attached are the test results of the subject model performed on October 29, 2011.

If you should have any questions concerning these data, please let us know.

Sincerely,
AIR MOVEMENT AND CONTROL
ASSOCIATION INTERNATIONAL, INC.

Josh Parent
Laboratory Manager

Attachment

Copy To: saeed@airengindustries.com

TEST INFORMATION

Test Number : 28023-S1
Purpose : Contract Test

Date of Test : 29 Oct 2011
Technician : LTH

UNIT INFORMATION

Customer : Aireng Company
Unit Manufacturer : Aireng Company
Type : Centrifugal
Trade Name : ATBIC
Model Number : 15
No. of Blades : 12
Blade Setting : NA
No. of Stator Vanes : NA
Impeller Diameter : 0.384 m
Inlet Area : 0.1134 m²
Outlet Area : 0.125 m²
Effective Duct Diameter : 0.38 m

TEST CONFIGURATION

Setup : AMCA Standard 300, Figure 2, Inlet Sound
Installation Type : B - Free Inlet, Ducted Outlet
Installation Notes : -

TEST ENVIRONMENT

Pb : 1003.6 h.Pa
tdo : 32.1 °C
two : 25.7 °C

Comments

Unit tested with AFMA built outlet duct
Air Volume taken from 28023-A1 dated 29 Oct 2011

Important Notes

Data exist where the background clearance of the test unit ($L_{PM} - L_{PB}$) does not meet the 6dB criteria required by AMCA Standard 300-05. These data are labeled with an asterisk ()*

RSS MEASUREMENT

Test Number 28023-S1
 Purpose Contract Test

Date of Test 29 Oct 2011
 Technician LTH

Reference Sound Source

AMCA Band Number	1			2			3			4		
Center Frequency (Hz)	<u>50</u>	<u>63</u>	<u>80</u>	<u>100</u>	<u>125</u>	<u>160</u>	<u>200</u>	<u>250</u>	<u>315</u>	<u>400</u>	<u>500</u>	<u>630</u>
L_{pqm}	49.2	59.2	62.4	63.7	66.7	66.9	68.2	69.5	70.2	70.1	70.8	71.3
L_{pb}	40.2	40.0	40.5	43.9	44.9	42.6	39.6	37.6	34.7	31.9	28.8	30.0
$L_{pqm} - L_{pb}$	9.1	19.1	21.9	19.8	21.8	24.3	28.5	31.9	35.5	38.1	42.1	41.3
$L_{pqm} - L_{pq}$	0.6	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
L_{pq}	48.6	59.1	62.4	63.7	66.7	66.9	68.2	69.5	70.2	70.1	70.8	71.3
L_{Wr}	77.2	78.6	78.9	79.9	79.7	80.0	80.3	80.4	80.5	80.6	80.8	81.6
$L_{Wr} - L_{pq}$	28.6	19.5	16.5	16.2	13.0	13.1	12.1	10.9	10.3	10.5	10.0	10.3
AMCA Band Number	5			6			7			8		
Center Frequency (Hz)	<u>800</u>	<u>1.0K</u>	<u>1.3K</u>	<u>1.6K</u>	<u>2.0K</u>	<u>2.5K</u>	<u>3.2K</u>	<u>4.0K</u>	<u>5.0K</u>	<u>6.3K</u>	<u>8.0K</u>	<u>10.0K</u>
L_{pqm}	73.0	74.2	75.2	75.4	75.2	73.6	71.9	71.8	70.8	69.1	66.3	63.1
L_{pb}	26.2	25.4	24.1	18.8	16.7	14.2	13.5	7.5	7.6	7.3	7.8	8.4
$L_{pqm} - L_{pb}$	46.9	48.8	51.2	56.7	58.5	59.4	58.5	64.3	63.2	61.8	58.5	54.7
$L_{pqm} - L_{pq}$	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
L_{pq}	73.0	74.2	75.2	75.4	75.2	73.6	71.9	71.8	70.8	69.1	66.3	63.1
L_{Wr}	83.4	84.6	85.6	86.0	86.7	85.4	84.2	84.4	83.9	82.9	80.8	79.1
$L_{Wr} - L_{pq}$	10.4	10.4	10.4	10.6	11.5	11.8	12.3	12.6	13.1	13.8	14.5	16.0

These test data were obtained in a laboratory accredited by AMCA for AMCA Standard 300 testing. Data are not certified by AMCA.

MEASUREMENT

Test Number 28023-S1
Purpose Contract Test

Test Date 29 Oct 2011
Technician LTH

Determination Number 1

AMCA Band Number	1			2			3			4		
Center Frequency (Hz)	<u>50</u>	<u>63</u>	<u>80</u>	<u>100</u>	<u>125</u>	<u>160</u>	<u>200</u>	<u>250</u>	<u>315</u>	<u>400</u>	<u>500</u>	<u>630</u>
L _{pm}	41.6	52.7	58.2	60.5	66.4	66.8	66.0	66.2	67.5	74.1	68.9	65.7
L _{pb}	40.3	38.7	38.9	42.5	42.6	40.4	37.5	36.4	32.6	27.6	25.9	24.1
L _{pm} - L _{pb}	1.3*	14.0	19.3	18.0	23.8	26.5	28.5	29.9	34.9	46.6	43.0	41.6
L _{pm} - L _{pc}	1.3	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
L _{pc}	40.3	52.6	58.2	60.5	66.4	66.8	66.0	66.2	67.5	74.1	68.9	65.7
L _{Wr} - L _{pq}	28.6	19.5	16.5	16.2	13.0	13.1	12.1	10.9	10.3	10.5	10.0	10.3
E _i	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
L _{Wmi}	68.8*	72.1	74.7	76.7	79.4	79.9	78.2	77.2	77.8	84.7	78.9	76.1

AMCA Band Number	5			6			7			8		
Center Frequency (Hz)	<u>800</u>	<u>1.0K</u>	<u>1.3K</u>	<u>1.6K</u>	<u>2.0K</u>	<u>2.5K</u>	<u>3.2K</u>	<u>4.0K</u>	<u>5.0K</u>	<u>6.3K</u>	<u>8.0K</u>	<u>10.0K</u>
L _{pm}	67.5	64.5	63.4	63.3	62.7	64.2	61.6	60.5	56.7	56.7	48.0	44.8
L _{pb}	19.1	16.0	13.3	13.5	12.0	15.7	11.5	10.4	11.6	12.9	12.1	13.4
L _{pm} - L _{pb}	48.4	48.6	50.1	49.7	50.7	48.5	50.0	50.1	45.1	43.8	35.8	31.5
L _{pm} - L _{pc}	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
L _{pc}	67.5	64.5	63.4	63.3	62.7	64.2	61.6	60.5	56.7	56.7	48.0	44.8
L _{Wr} - L _{pq}	10.4	10.4	10.4	10.6	11.5	11.8	12.3	12.6	13.1	13.8	14.5	16.0
E _i	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
L _{Wmi}	77.9	75.0	73.8	73.8	74.1	76.0	73.8	73.0	69.8	70.5	62.5	60.9

Test Conditions at Fan Inlet : Ps actual : 0.0 Pa density: 1.132 kg/m³
Td1 : 32.1 °C Pb : 100360 Pa

Determination Number 2

AMCA Band Number	1			2			3			4		
Center Frequency (Hz)	<u>50</u>	<u>63</u>	<u>80</u>	<u>100</u>	<u>125</u>	<u>160</u>	<u>200</u>	<u>250</u>	<u>315</u>	<u>400</u>	<u>500</u>	<u>630</u>
L _{pm}	42.2	56.3	51.1	57.6	63.1	63.5	63.0	62.5	63.3	70.0	64.8	61.8
L _{pb}	40.3	38.7	38.9	42.5	42.6	40.4	37.5	36.4	32.6	27.6	25.9	24.1
L _{pm} - L _{pb}	1.9*	17.6	12.2	15.1	20.5	23.2	25.4	26.1	30.7	42.4	39.0	37.7
L _{pm} - L _{pc}	1.3	0.1	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
L _{pc}	40.9	56.2	50.8	57.4	63.1	63.5	63.0	62.5	63.3	70.0	64.8	61.8
L _{Wr} - L _{pq}	28.6	19.5	16.5	16.2	13.0	13.1	12.1	10.9	10.3	10.5	10.0	10.3
E _i	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
L _{Wmi}	69.4*	75.7	67.3	73.6	76.1	76.6	75.1	73.4	73.6	80.5	74.8	72.1

AMCA Band Number	5			6			7			8		
Center Frequency (Hz)	<u>800</u>	<u>1.0K</u>	<u>1.3K</u>	<u>1.6K</u>	<u>2.0K</u>	<u>2.5K</u>	<u>3.2K</u>	<u>4.0K</u>	<u>5.0K</u>	<u>6.3K</u>	<u>8.0K</u>	<u>10.0K</u>
L _{pm}	64.1	61.6	60.0	59.7	58.7	57.8	53.9	52.1	51.1	55.5	41.9	39.9
L _{pb}	19.1	16.0	13.3	13.5	12.0	15.7	11.5	10.4	11.6	12.9	12.1	13.4
L _{pm} - L _{pb}	45.0	45.6	46.7	46.1	46.7	42.1	42.3	41.7	39.5	42.6	29.7	26.5
L _{pm} - L _{pc}	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
L _{pc}	64.1	61.6	60.0	59.7	58.7	57.8	53.9	52.1	51.1	55.5	41.8	39.9
L _{Wr} - L _{pq}	10.4	10.4	10.4	10.6	11.5	11.8	12.3	12.6	13.1	13.8	14.5	16.0
E _i	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
L _{Wmi}	74.5	72.0	70.4	70.2	70.2	69.7	66.1	64.7	64.1	69.3	56.4	55.9

Test Conditions at Fan Inlet : Ps actual : 502.9 Pa density: 1.132 kg/m³
Td1 : 32.1 °C Pb : 100360 Pa

MEASUREMENT

Test Number 28023-S1
 Purpose Contract Test

Test Date 29 Oct 2011
 Technician LTH

Determination Number 3

AMCA Band Number	1			2			3			4		
Center Frequency (Hz)	<u>50</u>	<u>63</u>	<u>80</u>	<u>100</u>	<u>125</u>	<u>160</u>	<u>200</u>	<u>250</u>	<u>315</u>	<u>400</u>	<u>500</u>	<u>630</u>
L _{pm}	42.1	55.4	49.5	55.8	62.2	73.8	63.9	62.8	61.5	66.4	61.0	59.2
L _{pb}	40.3	38.7	38.9	42.5	42.6	40.4	37.5	36.4	32.6	27.6	25.9	24.1
L _{pm} - L _{pb}	1.8*	16.7	10.6	13.3	19.6	33.4	26.4	26.4	28.9	38.9	35.1	35.1
L _{pm} - L _{pc}	1.3	0.1	0.4	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
L _{pc}	40.8	55.3	49.1	55.6	62.1	73.8	63.9	62.8	61.5	66.4	61.0	59.2
L _{Wr} - L _{pq}	28.6	19.5	16.5	16.2	13.0	13.1	12.1	10.9	10.3	10.5	10.0	10.3
E _i	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
L _{Wmi}	69.3*	74.8	65.6	71.8	75.2	86.9	76.1	73.7	71.8	77.0	70.9	69.6

AMCA Band Number	5			6			7			8		
Center Frequency (Hz)	<u>800</u>	<u>1.0K</u>	<u>1.3K</u>	<u>1.6K</u>	<u>2.0K</u>	<u>2.5K</u>	<u>3.2K</u>	<u>4.0K</u>	<u>5.0K</u>	<u>6.3K</u>	<u>8.0K</u>	<u>10.0K</u>
L _{pm}	60.1	58.7	56.2	55.3	55.2	54.9	51.7	50.3	50.1	55.8	41.0	40.8
L _{pb}	19.1	16.0	13.3	13.5	12.0	15.7	11.5	10.4	11.6	12.9	12.1	13.4
L _{pm} - L _{pb}	41.0	42.7	42.9	41.8	43.3	39.1	40.2	40.0	38.5	42.9	28.9	27.4
L _{pm} - L _{pc}	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
L _{pc}	60.1	58.7	56.2	55.3	55.2	54.9	51.7	50.3	50.1	55.8	41.0	40.8
L _{Wr} - L _{pq}	10.4	10.4	10.4	10.6	11.5	11.8	12.3	12.6	13.1	13.8	14.5	16.0
E _i	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
L _{Wmi}	70.5	69.1	66.6	65.8	66.7	66.7	63.9	62.9	63.2	69.7	55.5	56.8

Test Conditions at Fan Inlet : Ps actual : 832.2 Pa density: 1.132 kg/m³
 Td1 : 32.1 °C Pb : 100360 Pa

Determination Number 4

AMCA Band Number	1			2			3			4		
Center Frequency (Hz)	<u>50</u>	<u>63</u>	<u>80</u>	<u>100</u>	<u>125</u>	<u>160</u>	<u>200</u>	<u>250</u>	<u>315</u>	<u>400</u>	<u>500</u>	<u>630</u>
L _{pm}	46.1	56.7	58.6	59.7	64.8	72.8	66.9	67.0	66.8	68.2	65.2	63.5
L _{pb}	40.3	38.7	38.9	42.5	42.6	40.4	37.5	36.4	32.6	27.6	25.9	24.1
L _{pm} - L _{pb}	5.8*	18.0	19.6	17.2	22.2	32.5	29.4	30.6	34.1	40.6	39.4	39.4
L _{pm} - L _{pc}	1.3	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
L _{pc}	44.8	56.6	58.5	59.6	64.8	72.8	66.9	67.0	66.7	68.2	65.2	63.5
L _{Wr} - L _{pq}	28.6	19.5	16.5	16.2	13.0	13.1	12.1	10.9	10.3	10.5	10.0	10.3
E _i	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
L _{Wmi}	73.3*	76.1	75.0	75.8	77.8	86.0	79.0	77.9	77.1	78.7	75.2	73.8

AMCA Band Number	5			6			7			8		
Center Frequency (Hz)	<u>800</u>	<u>1.0K</u>	<u>1.3K</u>	<u>1.6K</u>	<u>2.0K</u>	<u>2.5K</u>	<u>3.2K</u>	<u>4.0K</u>	<u>5.0K</u>	<u>6.3K</u>	<u>8.0K</u>	<u>10.0K</u>
L _{pm}	62.3	61.2	58.2	57.9	56.8	57.0	53.3	51.8	51.0	56.1	41.7	40.5
L _{pb}	19.1	16.0	13.3	13.5	12.0	15.7	11.5	10.4	11.6	12.9	12.1	13.4
L _{pm} - L _{pb}	43.2	45.2	44.9	44.4	44.9	41.3	41.8	41.4	39.4	43.2	29.6	27.2
L _{pm} - L _{pc}	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
L _{pc}	62.3	61.2	58.2	57.9	56.8	57.0	53.3	51.8	51.0	56.1	41.7	40.5
L _{Wr} - L _{pq}	10.4	10.4	10.4	10.6	11.5	11.8	12.3	12.6	13.1	13.8	14.5	16.0
E _i	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
L _{Wmi}	72.7	71.7	68.6	68.4	68.3	68.8	65.5	64.4	64.0	69.9	56.3	56.6

Test Conditions at Fan Inlet : Ps actual : 878.4 Pa density: 1.132 kg/m³
 Td1 : 32.1 °C Pb : 100360 Pa

TEST RESULTS

Test Number 28023-S1
 Purpose Contract Test

Date of Test 29 Oct 2011
 Technician LTH

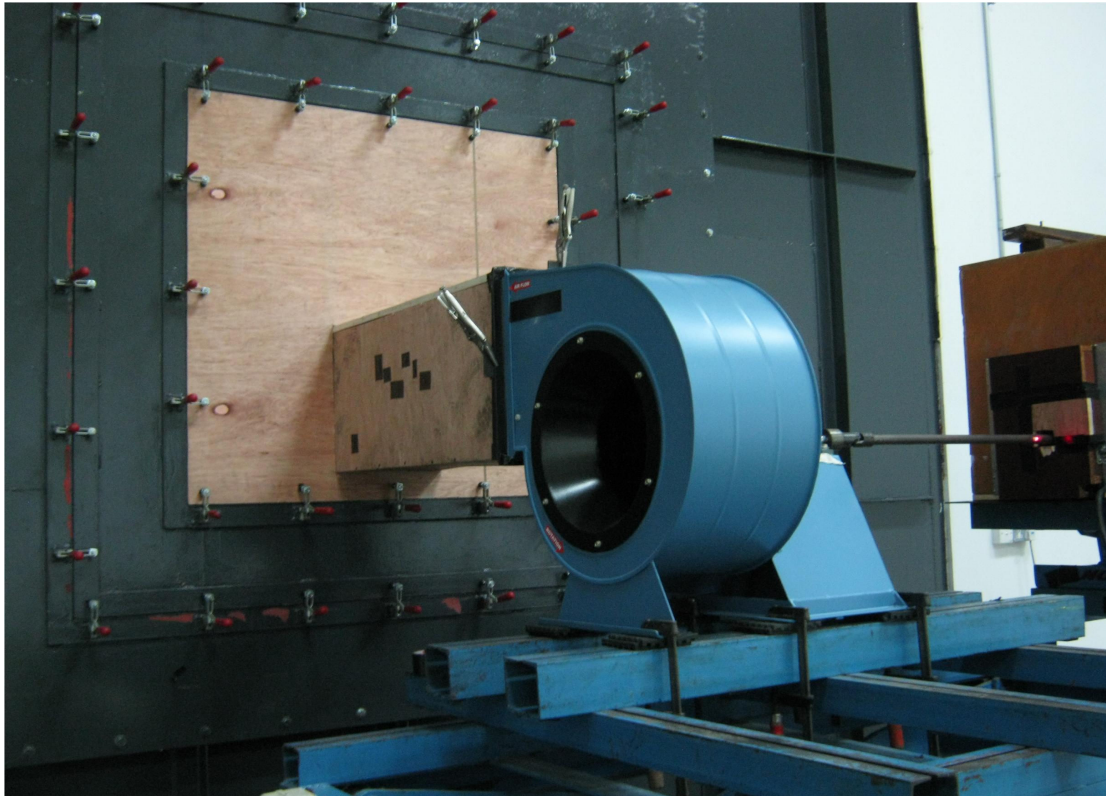
AMCA Band Number Center Frequency (Hz)	1	2	3	4	5	6	7	8	Point of Operation		
	<u>63</u>	<u>125</u>	<u>250</u>	<u>500</u>	<u>1.0K</u>	<u>2.0K</u>	<u>4.0K</u>	<u>8.0K</u>	<u>P_s</u> Pa	<u>Q</u> m ³ /s	<u>N</u> rpm
Det. No. : 1 L _{wi} (dB) :	77*	84	82	86	81	80	77	72	0	1.42	2000
Det. No. : 2 L _{wi} (dB) :	77*	80	79	82	77	75	70	70	533	1.06	2000
Det. No. : 3 L _{wi} (dB) :	76*	87	79	79	74	71	68	70	882	0.73	2000
Det. No. : 4 L _{wi} (dB) :	80*	87	83	81	76	73	69	70	931	0.48	2001

These test data were obtained in a laboratory accredited by AMCA for AMCA Standard 300 testing. Data are not certified by AMCA.

TEST SETUP PICTURE

Test Unit : Centrifugal
Manufacturer : Aireng Company
Trade Name : ATBIC
Model No. : 15

Test Number : 28023-S1
Date of Test : 29 Oct 2011



Sound Performance Test
Figure 2 Setup
Installation Type : B - Free Inlet, Ducted Outlet

INSTRUMENT LIST

Test Number: 28023-S1

Date of Test: 29 Oct 2011

Technician: LTH

The following instruments, calibrated as applicable per AMCA standards, were used for this test

PRESSURE

Instruments	Manufacturer
<input checked="" type="checkbox"/> Static Pressure Transducer FC0332	Furness
<input type="checkbox"/> Total Pressure Transducer FC0332	Furness
<input type="checkbox"/> Static & Total Pressure Transducer FC0332	Furness
<input checked="" type="checkbox"/> Barometric Pressure Transmitter T2114	Comet

TEMPERATURE

Instruments	Manufacturer
<input type="checkbox"/> RTD Sensor Plane 5-Fig 12	Valutemp
<input type="checkbox"/> RTD Sensor Plane 8-Fig 15	Valutemp
<input checked="" type="checkbox"/> Humidity Transducer TH-200-HN/STH-PD150	Kimo

SPEED

Instruments	Manufacturer
<input checked="" type="checkbox"/> Speed Meter & Diffuse Reflective Sensor MP5W-44 & BM200-DDT	Autonics

ELECTRIC METER

Instruments	Manufacturer
<input type="checkbox"/> Multimeter Fluke 322	Fluke
<input type="checkbox"/> Power Meter WT230	Yokogawa

TORQUE

Instruments	Manufacturer
<input type="checkbox"/> Torque Transducer 1604-200 (5.5kW)	Lebow
<input type="checkbox"/> Torque Transducer 1604-2000 (37kW)	Lebow
<input type="checkbox"/> Strain-Gauge Conditioner Type 3278 Torque Readout	Daytronics

SOUND

Instruments	Manufacturer
<input checked="" type="checkbox"/> Pulse Data Acquisition & CPB Analysis Types 3560-B-010 & 7771-N2	Bruel & Kjaer
<input checked="" type="checkbox"/> Diffuse-field microphone Type 4943	Bruel & Kjaer
<input checked="" type="checkbox"/> Microphone Preamplifier Type 2669-L	Bruel & Kjaer
<input checked="" type="checkbox"/> Rotating Boom Type 3923	Bruel & Kjaer
<input checked="" type="checkbox"/> Pistonphone for Acoustic Calibration Type 4228	Bruel & Kjaer
<input checked="" type="checkbox"/> Reference Sound Source RSS Type 4204	Bruel & Kjaer
<input checked="" type="checkbox"/> Correction Barometer Type UZ001	Bruel & Kjaer