



SINCE 1896

REPORT

Intertek ETL SEMKO

3933 US ROUTE 11 CORTLAND, NEW YORK 13045

Order No. 3096540

Revision Date: August 23, 2006

Original Issue Date: June 16, 2006

REPORT NO. 3096540CRT-001a

STATIC PRESSURE, SOUND POWER LEVEL, AREA FACTOR AND THROW TESTS ON SQUARE FOUR WAY CEILING DIFFUSERS

RENDERED TO

**BEST CHOICE INDUSTRIES L.L.C.
P. O. BOX 31567
DUBAI, U.A.E.**

NOTE: Report revised to include watermark

INTRODUCTION

This report gives the results of tests conducted on five Multicore Square Diffusers. The test results include Static Pressure, Area Factor, Throw and Sound Power Level. The samples were selected and supplied by the client and were received at the laboratories on May 5, 2006. The samples appeared to be in new unused condition upon receipt.

AUTHORIZATION

Signed Intertek Quotation No. 19932299

TEST METHOD

The diffusers were tested in accordance with the ASHRAE 70-1991 Standard "Method of Testing for Rating the Performance of Air Outlets and Inlets", which incorporates ADC 1062: GRD-84 Test Code for Grilles, Registers and Diffusers. Acoustical data was obtained employing a Bruel & Kjaer Digital Frequency Analyzer Type 2131 and analyzed on a CompuAdd 286 Computer and Epson LQ-850 printer. The reference sound source used for this test was a calibrated Bruel & Kjaer Type 4204, which conforms to the above standard. The octave band sound power levels were plotted on graph of Noise Criteria Curves which is in the ADC Test Code. These curves are reprinted with permission from the ASHRAE Handbook and Product Directory, 1976. Each diffuser was installed in the facility and supplied with measured volumes of air. The static pressure was measured 1½ duct diameters upstream of each diffuser inlet.

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DESCRIPTION OF TEST SPECIMENS

The four multicore square ceiling diffusers were constructed from aluminum. The back of each diffuser had a square opposed blade damper attached to the inlet. Five square neck sizes were used for the testing; 150, 225, 300, 375, and 450 millimeter. The multicore face of each 4-way throw diffuser consisted of deflector blades, starting in the center with a 75 mm square and each additional square being 75 mm larger than the previous. The size 150 had one additional blade, whereas the size 450 had five additional blades. The opposed blade dampers were in the full open position for all of the testing.

RESULTS OF TESTS

| <u>Octave Band Center Frequency Hertz</u> | SAD 4WS 150 X 150 Square Ceiling Diffuser <u>Discharge Sound Power Level dB re 10⁻¹² Watt</u> | | | | |
|---|--|-------|-------|-------|-------|
| 125 | 43.0 | 45.0 | 48.0 | 50.0 | 51.5 |
| 250 | 38.5 | 41.0 | 44.0 | 47.0 | 49.0 |
| 500 | 33.5 | 36.5 | 40.0 | 43.0 | 45.5 |
| 1000 | 24.5 | 30.5 | 35.5 | 40.5 | 47.5 |
| 2000 | 21.0* | 24.0 | 30.5 | 36.5 | 48.0 |
| 4000 | 22.0* | 22.0* | 22.0* | 26.0 | 31.0 |
| 8000 | 28.0* | 28.0* | 28.0* | 28.0* | 28.0* |
| Supply Air Volume, CFM | 300 | 350 | 400 | 450 | 500 |
| Inlet Static Pressure, in. H ₂ O | 0.080 | 0.110 | 0.142 | 0.180 | 0.225 |
| **Noise Criteria (NC) | 17 | 21 | 24 | 30 | 39 |

* Sound Power Level data 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.

** Noise Criteria ratings were determined by subtracting a room absorption of 10dB from the Sound Power Level data.

Checked by 

RESULTS OF TESTS (cont'd)

| Octave Band Center Frequency Hertz | SAD 4WS 225 X 225 Square Ceiling Diffuser | | | | | | | |
|---|--|-------|-------|-------|-------|-------|-------|-------|
| | <u>Discharge Sound Power Level dB re 10⁻¹² Watt</u> | | | | | | | |
| 125 | 42.0 | 44.0 | 47.5 | 50.0 | 52.0 | 54.5 | 56.0 | |
| 250 | 40.0 | 42.5 | 45.5 | 48.0 | 50.5 | 52.5 | 55.5 | |
| 500 | 35.5 | 40.0 | 44.0 | 47.5 | 50.0 | 51.5 | 53.5 | |
| 1000 | 28.0 | 33.5 | 39.5 | 44.0 | 48.5 | 52.0 | 55.5 | |
| 2000 | 22.5* | 26.0 | 33.5 | 39.0 | 44.0 | 47.5 | 51.5 | |
| 4000 | 21.5* | 21.5* | 23.0* | 28.5 | 34.0 | 39.0 | 44.0 | |
| 8000 | 27.5* | 27.5* | 27.5* | 28.0* | 28.0* | 28.5 | 32.5 | |
| Supply Air Volume, CFM | 250 | 300 | 350 | 400 | 450 | 500 | 550 | |
| Inlet Static Pressure, in. H ₂ O | 0.070 | 0.100 | 0.138 | 0.180 | 0.225 | 0.280 | 0.340 | |
| **Noise Criteria (NC) | 18 | 25 | 29 | 33 | 37 | 41 | 45 | |
| | | | | | | | | |
| Octave Band Center Frequency Hertz | SAD 4WS 300 X 300 Square Ceiling Diffuser | | | | | | | |
| | <u>Discharge Sound Power Level dB re 10⁻¹² Watt</u> | | | | | | | |
| 125 | 45.0 | 46.5 | 48.5 | 51.0 | 52.0 | 54.5 | 56.5 | 58.0 |
| 250 | 41.0 | 43.0 | 45.5 | 47.0 | 48.5 | 50.5 | 52.5 | 54.5 |
| 500 | 37.0 | 40.0 | 43.0 | 45.5 | 47.0 | 49.5 | 51.0 | 52.5 |
| 1000 | 28.5 | 33.0 | 36.5 | 40.5 | 43.0 | 46.0 | 49.0 | 51.0 |
| 2000 | 22.5* | 25.0 | 30.5 | 35.5 | 38.5 | 42.5 | 45.5 | 48.0 |
| 4000 | 21.5* | 21.5* | 22.0* | 24.0 | 27.0 | 31.5 | 35.0 | 38.0 |
| 8000 | 27.5* | 27.5* | 27.5* | 27.5* | 27.5* | 27.5* | 28.0* | 28.5* |
| Supply Air Volume, CFM | 400 | 450 | 500 | 550 | 600 | 650 | 700 | 750 |
| Inlet Static Pressure, in. H ₂ O | 0.075 | 0.094 | 0.116 | 0.138 | 0.162 | 0.192 | 0.225 | 0.260 |
| **Noise Criteria (NC) | 21 | 24 | 28 | 31 | 32 | 35 | 38 | 40 |

* Sound Power Level data 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.

** Noise Criteria ratings were determined by subtracting a room absorption of 10dB from the Sound Power Level data.

Checked by: 

RESULTS OF TESTS (cont'd)

| Octave Band Center Frequency Hertz | SAD 4WS 375 X 375 Square Ceiling Diffuser | | | | | |
|---|--|-------|-------|-------|-------|-------|
| | Discharge Sound Power Level dB re 10 ⁻¹² Watt | | | | | |
| 125 | 42.0 | 45.0 | 46.5 | 49.5 | 51.5 | 54.0 |
| 250 | 37.5 | 41.0 | 43.0 | 46.0 | 48.5 | 51.0 |
| 500 | 33.0 | 39.5 | 42.5 | 46.0 | 48.5 | 51.0 |
| 1000 | 23.5 | 30.0 | 34.5 | 40.5 | 45.0 | 49.5 |
| 2000 | 21.0* | 22.5* | 27.5 | 34.0 | 39.0 | 44.0 |
| 4000 | 21.5* | 21.5* | 21.5* | 23.5* | 27.5 | 33.0 |
| 8000 | 27.5* | 27.5* | 27.5* | 27.5* | 27.5* | 27.5* |
| Supply Air Volume, CFM | 500 | 600 | 700 | 800 | 900 | 1000 |
| Inlet Static Pressure, in. H ₂ O | 0.052 | 0.072 | 0.100 | 0.130 | 0.160 | 0.200 |
| **Noise Criteria (NC) | 17 | 24 | 27 | 31 | 34 | 39 |

| Octave Band Center Frequency Hertz | SAD 4WS 450 X 450 Square Ceiling Diffuser | | | | |
|---|--|-------|-------|-------|-------|
| | Discharge Sound Power Level dB re 10 ⁻¹² Watt | | | | |
| 125 | 39.0* | 41.5 | 47.0 | 52.0 | 57.0 |
| 250 | 36.0 | 39.5 | 45.5 | 49.5 | 54.0 |
| 500 | 29.5 | 35.5 | 45.0 | 50.0 | 54.0 |
| 1000 | 23.0 | 26.0 | 37.5 | 45.0 | 52.5 |
| 2000 | 21.0 | 23.0 | 30.0 | 39.5 | 47.0 |
| 4000 | 21.0* | 21.5* | 21.5* | 28.5 | 37.0 |
| 8000 | 27.5* | 27.5* | 27.5* | 27.5* | 28.5* |
| Supply Air Volume, CFM | 600 | 750 | 1000 | 1250 | 1500 |
| Inlet Static Pressure, in. H ₂ O | 0.034 | 0.052 | 0.094 | 0.145 | 0.208 |
| **Noise Criteria (NC) | <15 | 20 | 30 | 35 | 42 |

* Sound Power Level data 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.

** Noise Criteria ratings were determined by subtracting a room absorption of 10dB from the Sound Power Level data.

Checked by: 

AREA FACTOR A_k

FOR AIR OUTLETS AND AIR INLETS

Model: SAD 4WS 150 x 150

Manufacturer: Best Choice Industries Inlet Size: 140 mm X 140 mm Date: May 18, 2006
 Throw Dir.: Horizontal Neck Area (Sq. Ft.): 0.211 Air Density: 0.070 lbs/ft²
 Flow Meter: Nozzle Metering Station Anemometer: Alnor Velometer Type 6000P
 Serial Number: 6077AL

| Run Number | Readings | | | | Calculations | | | | | |
|------------|------------------------|------|------|------|--------------------------|-------------|---------------|-----------|----------------|---------------|
| | Anemometer - (Vk, FPM) | | | | Static "H ₂ O | Q2 Flow CFM | Neck Velocity | Neck V.P. | Total Pressure | Area Fact. Ak |
| | 1 | 2 | 3 | 4 | | | | | | |
| 1 | 680 | 700 | 700 | 700 | 0.009 | 100 | 474 | 0.014 | 0.023 | 0.144 |
| 2 | 1325 | 1350 | 1350 | 1350 | 0.036 | 200 | 948 | 0.056 | 0.092 | 0.149 |
| 3 | 1950 | 1950 | 2000 | 2000 | 0.080 | 300 | 1422 | 0.126 | 0.203 | 0.152 |
| | | | | | | | | | Average: 0.148 | |

Checked by: 

BCI SAD 150 X 150

| Distance From Ceiling Inches | Air Volume: 200 CFM | | | | | | Inlet Static Pressure: 0.036" | | | | | | | | | |
|------------------------------|---------------------|-----|-----|-----|-----|-----|-------------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | 2' | 3' | 4' | 5' | 6' | | 7' | 8' | 9' | 10' | 11' | 12' | 13' | 14' | 15' | 16' |
| 1" | 445 | 400 | 375 | 320 | 285 | 240 | 205 | 175 | 140 | 120 | 100 | 90 | 80 | 65 | 55 | 45 |
| 3" | 95 | 110 | 150 | 170 | 160 | 150 | 145 | 140 | 125 | 110 | 95 | 90 | 85 | 70 | 60 | 55 |
| 6" | 30 | 35 | 40 | 35 | 65 | 80 | 90 | 90 | 80 | 75 | 70 | 65 | 65 | 60 | 60 | 50 |
| 9" | 20 | 30 | 30 | 40 | 30 | 35 | 40 | 45 | 40 | 50 | 55 | 60 | 55 | 55 | 50 | 40 |
| 12" | 35 | 20 | 15 | 15 | 15 | 15 | 25 | 25 | 25 | 20 | 30 | 25 | 20 | 20 | 25 | 35 |
| 18" | 30 | 15 | 10 | 15 | 15 | 15 | 15 | 20 | 20 | 20 | 20 | 25 | 20 | 15 | 20 | 30 |
| 24" | 30 | 20 | 15 | 10 | 10 | 15 | 15 | 15 | 20 | 20 | 20 | 20 | 20 | 20 | 15 | 20 |

| Distance From Ceiling Inches | Air Volume: 150 CFM | | | | | | Inlet Static Pressure: 0.020" | | | | | | | | | |
|------------------------------|---------------------|-----|-----|-----|-----|-----|-------------------------------|-----|----|-----|-----|-----|-----|-----|-----|----|
| | 2' | 3' | 4' | 5' | 6' | | 7' | 8' | 9' | 10' | 11' | 12' | 13' | 14' | 15' | |
| 1" | 435 | 350 | 290 | 220 | 175 | 145 | 120 | 105 | 95 | 75 | 65 | 55 | 50 | 50 | 45 | 45 |
| 3" | 80 | 80 | 85 | 95 | 90 | 85 | 80 | 75 | 75 | 70 | 65 | 50 | 50 | 45 | 45 | 45 |
| 6" | 20 | 35 | 25 | 40 | 35 | 50 | 55 | 55 | 50 | 50 | 45 | 40 | 35 | 30 | 35 | 35 |
| 9" | 15 | 25 | 20 | 25 | 20 | 40 | 25 | 35 | 30 | 35 | 35 | 30 | 30 | 25 | 30 | 30 |
| 12" | 15 | 15 | 15 | 20 | 30 | 30 | 30 | 20 | 25 | 20 | 25 | 25 | 25 | 35 | 20 | 20 |
| 18" | 15 | 10 | 20 | 15 | 15 | 20 | 15 | 25 | 15 | 25 | 20 | 15 | 15 | 20 | 15 | 15 |
| 24" | 15 | 10 | 10 | 10 | 15 | 10 | 15 | 15 | 15 | 15 | 15 | 10 | 15 | 10 | 10 | 10 |

| Distance From Ceiling Inches | Air Volume: 115 CFM | | | | | | Inlet Static Pressure: 0.010" | | | | | | | | | |
|------------------------------|---------------------|-----|-----|-----|-----|-----|-------------------------------|----|----|-----|-----|-----|-----|-----|-----|----|
| | 2' | 3' | 4' | 5' | 6' | | 7' | 8' | 9' | 10' | 11' | 12' | 13' | 14' | 15' | |
| 1" | 355 | 265 | 195 | 145 | 135 | 120 | 105 | 90 | 70 | 65 | 60 | 50 | 40 | 30 | 35 | 35 |
| 3" | 65 | 70 | 75 | 75 | 70 | 70 | 65 | 60 | 60 | 55 | 55 | 50 | 45 | 40 | 35 | 35 |
| 6" | 40 | 15 | 20 | 30 | 30 | 30 | 40 | 45 | 40 | 40 | 35 | 30 | 30 | 35 | 30 | 30 |
| 9" | 40 | 15 | 20 | 30 | 30 | 30 | 40 | 45 | 40 | 40 | 35 | 30 | 30 | 35 | 30 | 30 |
| 12" | 35 | 15 | 15 | 15 | 15 | 20 | 20 | 20 | 20 | 20 | 20 | 15 | 20 | 25 | 15 | 15 |
| 18" | 35 | 15 | 15 | 15 | 15 | 20 | 20 | 20 | 20 | 20 | 20 | 15 | 20 | 25 | 15 | 15 |
| 24" | 30 | 10 | 10 | 10 | 10 | 15 | 10 | 15 | 15 | 10 | 15 | 10 | 10 | 20 | 15 | 15 |

Checked by: 



AREA FACTOR A_k

FOR AIR OUTLETS AND AIR INLETS

Model: SAD 4WS 225 x 225

| Manufacturer: Best Choice Industries Throw Dir.: Horizontal Flow Meter: Nozzle Metering Station | | Inlet Size: 215 mm x 215 mm Neck Area (Sq. Ft.): 0.498 Anemometer: Alnor Velometer Type 6000P Serial Number: 6077AL | | Date: May 18, 2006 Air Density: 0.070 lbs/ft ² | | | | | | |
|---|------------------------|--|------|--|--------------------------|-------------|---------------|-----------|----------------|------------------|
| Run Number | Readings | | | | Calculations | | | | | |
| | Anemometer - (Vk, FPM) | | | | Static "H ₂ O | Q2 Flow CFM | Neck Velocity | Neck V.P. | Total Pressure | Area Fact. A_k |
| 1 | 2 | 3 | 4 | Average | | | | | | |
| 1 | 1125 | 1125 | 1150 | 1125 | 0.070 | 250 | 502 | 0.016 | 0.086 | 0.221 |
| 2 | 1550 | 1500 | 1500 | 1550 | 0.138 | 350 | 703 | 0.031 | 0.169 | 0.229 |
| 3 | 2150 | 2100 | 2150 | 2150 | 0.280 | 500 | 1004 | 0.063 | 0.343 | 0.234 |
| | | | | | | | | | Average: 0.228 | |

Checked by: 

BCI SAD 225 X 225

Air Volume: 300 CFM
Inlet Static Pressure: 0.101"

| Distance From Ceiling Inches | Distance From Diffuser (Ft) | | | | | | Inlet Static Pressure | | | | | | | | | |
|------------------------------|-----------------------------|-----|-----|-----|-----|-----|-----------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | 1' | 2' | 3' | 4' | 5' | 6' | 7' | 8' | 9' | 10' | 11' | 12' | 13' | 14' | 15' | 16' |
| 1" | 550 | 550 | 485 | 350 | 260 | 230 | 190 | 180 | 145 | 120 | 100 | 95 | 85 | 75 | 70 | 60 |
| 3" | 355 | 350 | 260 | 185 | 180 | 160 | 150 | 145 | 130 | 110 | 100 | 90 | 80 | 70 | 65 | 55 |
| 6" | 55 | 50 | 75 | 75 | 95 | 100 | 95 | 95 | 90 | 85 | 80 | 75 | 70 | 65 | 60 | 50 |
| 9" | 35 | 30 | 35 | 35 | 35 | 40 | 55 | 60 | 50 | 50 | 50 | 50 | 50 | 45 | 50 | 40 |
| 12" | 30 | 25 | 30 | 30 | 30 | 30 | 30 | 35 | 40 | 35 | 40 | 35 | 40 | 35 | 30 | 30 |
| 18" | 25 | 20 | 25 | 30 | 25 | 30 | 25 | 30 | 25 | 25 | 20 | 20 | 30 | 20 | 30 | 25 |
| 24" | 25 | 20 | 30 | 30 | 30 | 30 | 25 | 25 | 30 | 20 | 25 | 20 | 25 | 20 | 20 | 30 |

Air Volume: 220 CFM
Inlet Static Pressure: .055"

| Distance From Ceiling Inches | Distance From Diffuser (Ft) | | | | | | Inlet Static Pressure | | | | | | | | | |
|------------------------------|-----------------------------|-----|-----|-----|-----|-----|-----------------------|-----|-----|-----|-----|-----|-----|-----|-----|----|
| | 1' | 2' | 3' | 4' | 5' | 6' | 7' | 8' | 9' | 10' | 11' | 12' | 13' | 14' | 15' | |
| 1" | 425 | 375 | 290 | 225 | 195 | 160 | 140 | 120 | 100 | 95 | 80 | 75 | 65 | 55 | 50 | 50 |
| 3" | 100 | 115 | 130 | 145 | 135 | 125 | 110 | 105 | 95 | 90 | 80 | 75 | 60 | 50 | 50 | 50 |
| 6" | 45 | 30 | 45 | 45 | 50 | 60 | 65 | 65 | 60 | 55 | 55 | 50 | 45 | 45 | 40 | 40 |
| 9" | 35 | 25 | 20 | 20 | 30 | 25 | 30 | 35 | 35 | 35 | 40 | 30 | 30 | 35 | 30 | 30 |
| 12" | 35 | 20 | 15 | 15 | 15 | 15 | 25 | 25 | 25 | 20 | 30 | 25 | 20 | 20 | 25 | 25 |
| 18" | 30 | 15 | 10 | 15 | 15 | 15 | 15 | 20 | 20 | 20 | 20 | 25 | 20 | 15 | 20 | 20 |
| 24" | 30 | 20 | 15 | 10 | 10 | 15 | 15 | 15 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 15 |

Air Volume: 140 CFM
Inlet Static Pressure: 0.022"

| Distance From Ceiling Inches | Distance From Diffuser (Ft) | | | | | | Inlet Static Pressure | | | | | | | | | |
|------------------------------|-----------------------------|-----|-----|-----|-----|-----|-----------------------|----|----|-----|-----|-----|-----|-----|-----|----|
| | 1' | 2' | 3' | 4' | 5' | 6' | 7' | 8' | 9' | 10' | 11' | 12' | 13' | 14' | 15' | |
| 1" | 275 | 245 | 190 | 170 | 145 | 120 | 105 | 90 | 75 | 70 | 65 | 55 | 40 | 40 | 40 | 40 |
| 3" | 50 | 45 | 35 | 55 | 55 | 65 | 65 | 75 | 60 | 60 | 50 | 45 | 40 | 45 | 40 | 40 |
| 6" | 40 | 35 | 20 | 30 | 30 | 30 | 40 | 45 | 40 | 40 | 35 | 30 | 30 | 35 | 30 | 30 |
| 9" | 35 | 15 | 15 | 15 | 15 | 20 | 20 | 20 | 20 | 20 | 20 | 15 | 20 | 25 | 15 | 15 |
| 12" | 30 | 10 | 10 | 10 | 10 | 15 | 10 | 15 | 15 | 10 | 15 | 10 | 10 | 20 | 15 | 15 |
| 18" | 25 | 10 | 10 | 5 | 10 | 15 | 10 | 5 | 10 | 10 | 10 | 15 | 10 | 10 | 10 | 10 |
| 24" | 25 | 10 | 5 | 5 | 10 | 15 | 15 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |

Checked by: 



AREA FACTOR A_k

FOR AIR OUTLETS AND AIR INLETS

Model: SAD 4WS 300 x 300

Manufacturer: Best Choice Industries Inlet Size: 290 mm x 290 mm Date: May 18, 2006
 Throw Dir.: Horizontal Neck Area (Sq. Ft.): 0.905 Air Density: 0.070 lbs/ft²
 Flow Meter: Nozzle Metering Station Anemometer: Alnor Velometer Type 6000P
 Serial Number: 6077AL

| Run Number | Readings | | | | Calculations | | | | | |
|------------|-----------------------------|------|------|------|--------------------------|-------------|---------------|-----------|----------------|------------------|
| | Anemometer - (V_k , FPM) | | | | Static "H ₂ O | Q2 Flow CFM | Neck Velocity | Neck V.P. | Total Pressure | Area Fact. A_k |
| | 1 | 2 | 3 | 4 | | | | | | |
| 1 | 1200 | 1150 | 1150 | 1200 | 0.094 | 450 | 497 | 0.015 | 0.109 | 0.383 |
| 2 | 1525 | 1550 | 1550 | 1575 | 0.162 | 600 | 663 | 0.028 | 0.190 | 0.387 |
| 3 | 2000 | 1950 | 2000 | 1950 | 0.260 | 750 | 829 | 0.043 | 0.303 | 0.380 |
| | | | | | | | | | Average: 0.383 | |

Checked by: 

BCI SAD300X300

| Distance From Ceiling Inches | Air Volume: 300 CFM | | | | | | Inlet Static Pressure: 0.042" | | | | | | | | |
|------------------------------|---------------------|-----|-----|-----|-----|-----|-------------------------------|-----|-----|-----|-----|-----|-----|-----|-----|
| | 2' | 3' | 4' | 5' | 6' | | 7' | 8' | 9' | 10' | 11' | 12' | 13' | 14' | 15' |
| 1" | 390 | 365 | 340 | 270 | 240 | 205 | 170 | 150 | 140 | 120 | 110 | 100 | 95 | 85 | 80 |
| 3" | 295 | 260 | 240 | 220 | 210 | 185 | 170 | 145 | 140 | 125 | 115 | 105 | 95 | 85 | 75 |
| 6" | 100 | 175 | 195 | 190 | 155 | 150 | 135 | 110 | 100 | 90 | 80 | 75 | 70 | 60 | 55 |
| 9" | 30 | 30 | 55 | 75 | 85 | 90 | 75 | 70 | 65 | 65 | 60 | 60 | 55 | 50 | 45 |
| 12" | 25 | 25 | 30 | 35 | 40 | 45 | 50 | 45 | 40 | 40 | 50 | 55 | 45 | 45 | 40 |
| 18" | 25 | 25 | 25 | 20 | 25 | 20 | 25 | 25 | 25 | 20 | 30 | 30 | 30 | 30 | 25 |
| 24" | 25 | 20 | 25 | 20 | 25 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 25 | 25 | 15 |

| Distance From Ceiling Inches | Air Volume: 240 CFM | | | | | | Inlet Static Pressure: 0.027" | | | | | | | | |
|------------------------------|---------------------|-----|-----|-----|-----|-----|-------------------------------|-----|-----|-----|-----|-----|-----|-----|-----|
| | 2' | 3' | 4' | 5' | 6' | | 7' | 8' | 9' | 10' | 11' | 12' | 13' | 14' | 15' |
| 1" | 320 | 290 | 275 | 240 | 215 | 170 | 145 | 130 | 110 | 105 | 90 | 80 | 70 | 60 | 55 |
| 3" | 240 | 230 | 225 | 210 | 195 | 150 | 130 | 120 | 105 | 100 | 95 | 85 | 70 | 65 | 60 |
| 6" | 80 | 120 | 165 | 150 | 145 | 125 | 115 | 90 | 85 | 75 | 70 | 70 | 65 | 55 | 55 |
| 9" | 30 | 25 | 50 | 55 | 65 | 70 | 65 | 60 | 55 | 50 | 55 | 50 | 50 | 40 | 40 |
| 12" | 30 | 25 | 25 | 30 | 35 | 45 | 40 | 35 | 30 | 30 | 45 | 30 | 40 | 40 | 35 |
| 18" | 25 | 20 | 15 | 20 | 20 | 25 | 20 | 25 | 20 | 10 | 35 | 25 | 25 | 30 | 20 |
| 24" | 25 | 15 | 15 | 20 | 20 | 20 | 20 | 20 | 20 | 15 | 25 | 20 | 15 | 25 | 15 |

| Distance From Ceiling Inches | Air Volume: 180 CFM | | | | | | Static Pressure: 0.015" | | | | | | | | |
|------------------------------|---------------------|-----|-----|-----|-----|-----|-------------------------|----|----|-----|-----|-----|-----|-----|-----|
| | 2' | 3' | 4' | 5' | 6' | | 7' | 8' | 9' | 10' | 11' | 12' | 13' | 14' | 15' |
| 1" | 275 | 240 | 210 | 180 | 150 | 130 | 100 | 95 | 85 | 80 | 70 | 65 | 55 | 50 | 50 |
| 3" | 205 | 160 | 140 | 135 | 120 | 115 | 90 | 85 | 80 | 75 | 70 | 65 | 60 | 50 | 50 |
| 6" | 30 | 50 | 80 | 105 | 100 | 95 | 70 | 65 | 55 | 55 | 50 | 50 | 50 | 45 | 40 |
| 9" | 20 | 15 | 25 | 45 | 55 | 55 | 45 | 40 | 35 | 35 | 40 | 35 | 35 | 40 | 30 |
| 12" | 15 | 15 | 15 | 20 | 30 | 30 | 30 | 20 | 25 | 20 | 25 | 25 | 25 | 35 | 20 |
| 18" | 15 | 10 | 10 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 20 | 15 | 15 | 20 | 15 |
| 24" | 15 | 10 | 10 | 10 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 10 | 15 | 10 | 10 |

Checked by: 



AREA FACTOR A_k

FOR AIR OUTLETS AND AIR INLETS

Model: SAD 4WS 375 x 375

Manufacturer: Best Choice Industries **Inlet Size:** 365 mm x 365 mm **Date:** May 18, 2006
Throw Dir.: Horizontal **Neck Area (Sq. Ft.):** 1.434 **Air Density:** 0.070 lbs/ft²
Flow Meter: Nozzle Metering Station **Anemometer:** Alnor Velometer Type 6000P
Serial Number: 6077AL

| Run Number | Readings | | | | Calculations | | | | | |
|-----------------------|-------------------------------------|------|------|------|--------------------------|-------------|---------------|-----------|----------------|---------------------------|
| | Anemometer - (V _k , FPM) | | | | Static "H ₂ O | Q2 Flow CFM | Neck Velocity | Neck V.P. | Total Pressure | Area Fact. A _k |
| | 1 | 2 | 3 | 4 | | | | | | |
| 1 | 900 | 925 | 950 | 950 | 0.051 | 500 | 349 | 0.008 | 0.059 | 0.537 |
| 2 | 1250 | 1300 | 1275 | 1275 | 0.100 | 700 | 488 | 0.015 | 0.115 | 0.549 |
| 3 | 1850 | 1900 | 1900 | 1850 | 0.205 | 1000 | 697 | 0.030 | 0.235 | 0.533 |
| Average: 0.540 | | | | | | | | | | |

Checked by: 



BCI 375X375

| Distance From Ceiling Inches | Air Volume: 250 CFM | | | | | | Inlet Static Pressure: 0.012" | | | | | | | | |
|------------------------------|---------------------|-----|-----|-----|-----|-----|-------------------------------|-----|-----|-----|-----|-----|-----|-----|-----|
| | 2' | 3' | 4' | 5' | 6' | | 7' | 8' | 9' | 10' | 11' | 12' | 13' | 14' | 15' |
| 1" | 270 | 240 | 200 | 175 | 150 | 125 | 115 | 105 | 100 | 95 | 75 | 70 | 70 | 60 | 55 |
| 3" | 135 | 180 | 160 | 140 | 135 | 125 | 115 | 105 | 105 | 95 | 75 | 65 | 65 | 60 | 50 |
| 6" | 30 | 80 | 90 | 90 | 90 | 90 | 80 | 80 | 75 | 70 | 65 | 65 | 60 | 50 | 40 |
| 9" | 20 | 20 | 25 | 35 | 40 | 45 | 50 | 55 | 50 | 45 | 40 | 25 | 45 | 40 | 30 |
| 12" | 15 | 15 | 20 | 20 | 20 | 20 | 30 | 40 | 35 | 30 | 30 | 20 | 30 | 30 | 20 |
| 18" | 15 | 15 | 15 | 20 | 15 | 15 | 15 | 15 | 20 | 15 | 15 | 15 | 15 | 15 | 10 |
| 24" | 15 | 15 | 15 | 20 | 15 | 15 | 15 | 10 | 15 | 10 | 15 | 15 | 15 | 15 | 10 |

| Distance From Ceiling Inches | Air Volume: 200 CFM | | | | | | Inlet Static Pressure: 0.080" | | | | | | | | |
|------------------------------|---------------------|-----|-----|-----|-----|-----|-------------------------------|----|----|-----|-----|-----|-----|-----|-----|
| | 2' | 3' | 4' | 5' | 6' | | 7' | 8' | 9' | 10' | 11' | 12' | 13' | 14' | 15' |
| 1" | 200 | 205 | 195 | 180 | 145 | 130 | 105 | 95 | 85 | 70 | 60 | 55 | 50 | 45 | 45 |
| 3" | 190 | 185 | 175 | 160 | 130 | 130 | 110 | 95 | 75 | 65 | 60 | 55 | 50 | 40 | 40 |
| 6" | 35 | 60 | 80 | 95 | 95 | 95 | 85 | 70 | 70 | 60 | 55 | 50 | 40 | 30 | 40 |
| 9" | 15 | 15 | 20 | 30 | 40 | 55 | 55 | 45 | 40 | 30 | 30 | 30 | 20 | 25 | 25 |
| 12" | 15 | 15 | 15 | 15 | 15 | 30 | 25 | 25 | 30 | 15 | 20 | 15 | 15 | 15 | 15 |
| 18" | 10 | 10 | 15 | 5 | 10 | 15 | 15 | 15 | 15 | 10 | 15 | 10 | 15 | 15 | 10 |
| 24" | 5 | 10 | 10 | 5 | 10 | 15 | 15 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |

| Distance From Ceiling Inches | Air Volume: 150 CFM | | | | | | Inlet Static Pressure: 0.045" | | | | | | | | |
|------------------------------|---------------------|-----|-----|-----|-----|----|-------------------------------|----|----|-----|-----|-----|-----|-----|-----|
| | 2' | 3' | 4' | 5' | 6' | | 7' | 8' | 9' | 10' | 11' | 12' | 13' | 14' | 15' |
| 1" | 185 | 160 | 150 | 130 | 115 | 95 | 80 | 75 | 65 | 55 | 50 | 45 | 40 | 30 | 30 |
| 3" | 140 | 135 | 130 | 115 | 110 | 95 | 70 | 70 | 60 | 55 | 55 | 50 | 45 | 35 | 30 |
| 6" | 25 | 40 | 70 | 75 | 70 | 65 | 50 | 50 | 40 | 45 | 40 | 40 | 35 | 30 | 20 |
| 9" | 15 | 10 | 20 | 25 | 30 | 35 | 30 | 30 | 25 | 25 | 20 | 25 | 20 | 20 | 15 |
| 12" | 10 | 10 | 10 | 10 | 10 | 20 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 10 |
| 18" | 10 | 10 | 5 | 5 | 5 | 10 | 5 | 10 | 10 | 10 | 10 | 10 | 5 | 10 | 5 |
| 24" | 10 | 10 | 5 | 5 | 10 | 10 | 5 | 10 | 5 | 10 | 10 | 10 | 5 | 5 | 10 |

Checked by: 



AREA FACTOR A_k

FOR AIR OUTLETS AND AIR INLETS

Model: SAD 4WS 450 x 450

| | | |
|--------------------------------------|--|--|
| Manufacturer: Best Choice Industries | Inlet Size: 440 mm X 440 mm | Date: May 18, 2006 |
| Throw Dir.: Horizontal | Neck Area (Sq. Ft.): 2.084 | Air Density: 0.070 lbs/ft ² |
| Flow Meter: Nozzle Metering Station | Anemometer: Alnor Velometer Type 6000P | |
| | Serial Number: 6077AL | |

| Run Number | Readings | | | | Calculations | | | | | |
|------------|-----------------------------|------|------|------|--------------------------|-------------|---------------|-----------|----------------|------------------|
| | Anemometer - (V_k , FPM) | | | | Static "H ₂ O | Q2 Flow CFM | Neck Velocity | Neck V.P. | Total Pressure | Area Fact. A_k |
| | 1 | 2 | 3 | 4 | | | | | | |
| 1 | 900 | 925 | 900 | 900 | 0.052 | 750 | 360 | 0.008 | 0.060 | 0.828 |
| 2 | 1500 | 1550 | 1550 | 1500 | 0.144 | 1250 | 600 | 0.023 | 0.167 | 0.820 |
| 3 | 1850 | 1825 | 1825 | 1850 | 0.208 | 1500 | 720 | 0.033 | 0.241 | 0.816 |
| | | | | | | | | | | Average: 0.821 |

Note: This unit was too large for testing in the "throw terminal facility"

Checked by: 

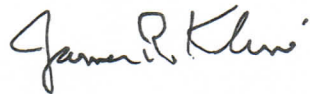


CONCLUSION

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.

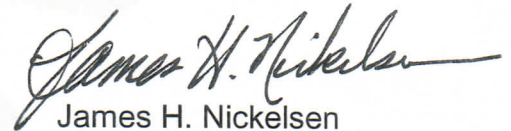
Date of Tests: May 16 through June 6, 2006

Report Approved By:



James R. Kline
Engineer/Quality Supervisor
Acoustical Testing

Report Reviewed By:



James H. Nickelsen
Senior Project Engineer
Acoustical Testing

Attachments: None