

REPORT

3933 US ROUTE 11 CORTLAND, NEW YORK 13045

Order No. 102761342

Date: November 3, 2016

REPORT NO. 102761342CRT-001a

**STATIC PRESSURE, SOUND POWER LEVEL,
AREA FACTOR AND THROW TESTS ON A
MODEL 2' X 2' PLAQUE SUPPLY
SQUARE CEILING DIFFUSER
WITH 12 INCH DIAMETER INLET**

RENDERED TO

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INTRODUCTION

This report gives the results of tests conducted on a Model 2' by 2' plaque supply Square Ceiling Diffuser. The test results include Static Pressure, Area Factor, Throw and Sound Power Level. The sample was selected and supplied by the client and was received at the laboratories on October 6, 2016. The sample appeared to be in new unused condition upon receipt.

AUTHORIZATION

Signed Intertek Quotation Number Qu-00716694

TEST METHOD

The diffuser was tested in accordance with the ASHRAE 70-2006 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 Pulse Digital Frequency Analyzer. 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. The diffuser was installed in the facility and supplied with measured volumes of air. The static pressure was measured 1½ duct diameters upstream of the diffuser.



DESCRIPTION OF TEST SPECIMEN

MODEL 2' X 2' PLAQUE SUPPLY SQUARE CEILING DIFFUSER WITH 12 INCH DIAMETER INLET

The diffuser was constructed from plastic. The diffuser measured 23 3/4 inches square at the face and the inlet measured 12 inches in diameter. The diffuser was tested with supply air only. A photograph of the test sample is available on the last page of the report.

EQUIPMENT

Equipment	Calibration Date	Due Date	S/N	Model	Asset
Pulse Analyzer	3/30/2016	3/30/2017	2519258	7539	E446
Reference Sound Source	9/24/2015	9/24/2018	2036621	4204	A230
Microphone/Pre - DF	9/27/2016	9/27/2017	2381161	4942	E450

RESULTS OF TESTS

Octave Band Center
Frequency Hertz

**MODEL 2' X 2' PLAQUE SUPPLY
SQUARE CEILING DIFFUSER
WITH 12 INCH DIAMETER INLET**

Discharge Sound Power Level dB re 10⁻¹² Watt

125	43.8	47.6	52.1	56.1	60.2
250	40.3	45.4	50.7	54.6	58.4
500	33.7	39.9	46.0	50.6	57.1
1000	25.2	33.0	40.1	45.1	53.5
2000	16.2*	21.0*	30.1	36.2	48.1
4000	16.4*	16.5*	18.2*	24.3*	39.7
8000	20.4*	20.4*	20.4*	20.7*	29.2*
Supply Air Volume, CFM.	275	325	400	450	500
Inlet Static Pressure, in. H ₂ O	0.06	0.08	0.12	0.15	0.19
**Noise Criteria (NC)	18	24	32	36	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.

AREA FACTOR A_k

FOR AIR OUTLETS

MODEL 2' X 2' PLAQUE SUPPLY SQUARE CEILING DIFFUSER WITH 12 INCH DIAMETER INLET

					Inlet Size	6 "	Radius	Air Density	0.072	lbs/ft ²	
Throw Dir.:	Horizontal				Neck Area (Sq. Ft.):	0.78539816					
Flow Meter:	Nozzle Metering Station				Anemometer:	Alnor Velometer Type 6000P					
					Serial Number:	6077AL				Date:	November 2, 2016
Run											
Number	Anemometer - (V_k , FPM)				Static	Q2 Flow	Neck	Neck	Total	Area Fact.	
	1	2	3	4	Average	"H ₂ O	CFM	Velocity	V.P.	Pressure	Ak
#1	1200	1200	1250	1250	1225	0.08	310	394.70	0.0093	0.089	0.253
#2	2000	2050	2050	2000	2025	0.19	500	636.62	0.0243	0.214	0.247
#3	2500	2700	2600	2700	2625	0.30	645	821.24	0.0404	0.340	0.246
										Average:	0.249



MODEL 2' X 2' PLAQUE SUPPLY SQUARE CEILING DIFFUSER WITH 12 INCH DIAMETER INLET

Distance	MODEL 2' X 2' PLAQUE SUPPLY w/ 12" Diameter Inlet										Air Volume	310 CFM
From	Inlet Static Pressure										0.080 " H2O	
Ceiling	Distance From Diffuser (Ft)											
Inches	0'	2'	4'	6'	8'	10'	12'	14'	16'	18'		
1"	78	198	148	103	62	48	32	30	28	7		
3"	57	74	97	84	68	52	40	34	32	8		
6"	46	39	45	44	51	37	29	33	29	9		
9"	37	31	22	23	31	31	24	29	27	9		
12"	32	29	24	22	25	22	14	23	22	9		
18"	29	28	26	24	27	25	10	21	16	11		
24"	24	25	27	22	22	24	9	13	10	8		

Distance	MODEL 2' X 2' PLAQUE SUPPLY w/ 12" Diameter Inlet										Air Volume	500 CFM
From	Inlet Static Pressure										0.190 " H2O	
Ceiling	Distance From Diffuser (Ft)											
Inches	0'	2'	4'	6'	8'	10'	12'	14'	16'	18'		
1"	131	361	246	164	119	99	81	50	47	32		
3"	90	132	156	149	114	92	87	54	50	34		
6"	73	74	72	94	86	75	73	45	53	39		
9"	59	57	53	46	52	51	53	38	52	38		
12"	53	49	53	36	36	43	40	33	43	36		
18"	50	47	50	37	33	40	27	25	29	35		
24"	51	42	41	40	36	38	29	20	27	36		

Distance	MODEL 2' X 2' PLAQUE SUPPLY w/ 12" Diameter Inlet										Air Volume	645 CFM
From	Inlet Static Pressure										0.300 " H2O	
Ceiling	Distance From Diffuser (Ft)											
Inches	0'	2'	4'	6'	8'	10'	12'	14'	16'	18'		
1"	165	490	319	227	166	126	115	82	67	49		
3"	122	169	212	190	158	121	120	87	70	49		
6"	101	66	89	109	121	94	97	74	55	52		
9"	87	59	49	57	71	69	77	56	49	54		
12"	76	59	43	49	51	53	54	47	45	44		
18"	71	61	43	51	44	47	34	36	32	32		
24"	77	66	47	42	38	50	26	31	27	28		

NOTE: All throw values are in feet per minute.

PHOTOGRAPH OF TEST SAMPLE



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.

Dates of Tests: October 21 through November 2, 2016

Report Approved by:


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Acoustical Testing

Report Reviewed By:


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Attachments: None