



## Performance Test Certificate

Issued To

**STAR ASIA JSC.  
LOT C3 PHUNG INDUSTRIAL PARK  
DAN PHUNG DISTRICT  
HANOI, VIETNAM**

Intertek has tested a representative sample of  
Model DAG600 Star Asia Double Layer Air Grille

A Double Layer Air Grille size 600 by 600 by 50 mm  
was tested in accordance with the standards listed below and was found  
to perform in a manner appropriate to the dictates of the standards.

### STANDARDS

ASHRAE 70-2006 Standard "Method of Testing for Rating the Performance of Air Outlets and Inlets"

ADC1062: GRD-84 "Test Code for Grilles, Registers and Diffusers"

### SCOPE OF TESTING

The double layer air grille was tested for the following performance characteristics:  
"Reference Intertek Report Number 104519155CRT-001b dated April 14, 2021".

- A) Sound Power Level ((NC)
- B) Air Volume versus Static Pressure
- C) Area Factor
- D) Throw Pattern

Date: April 23, 2021

James R. Kline  
Intertek  
Engineer / Quality Supervisor

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**REPORT****3933 US ROUTE 11 CORTLAND, NEW YORK 13045**

Order No. 104519155

Date: April 14, 2021

**REPORT NO. 104519155CRT-001b****STATIC PRESSURE, SOUND POWER LEVEL,  
AREA FACTOR AND THROW TESTS ON A  
MODEL DAG600 DOUBLE LAYER AIR GRILLE****RENDERED TO****STAR ASIA JSC.  
LOT C3 PHUNG INDUSTRIAL PARK  
DAN PHUNG DISTRICT  
HANOI, VIETNAM****INTRODUCTION**

This report gives the results of tests conducted on a Double Layer Air Grille. 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 March 5, 2020. The sample appeared to be in new unused condition upon receipt.

**AUTHORIZATION**

Signed Intertek Quotation No. Qu-01121111-0

**TEST METHOD**

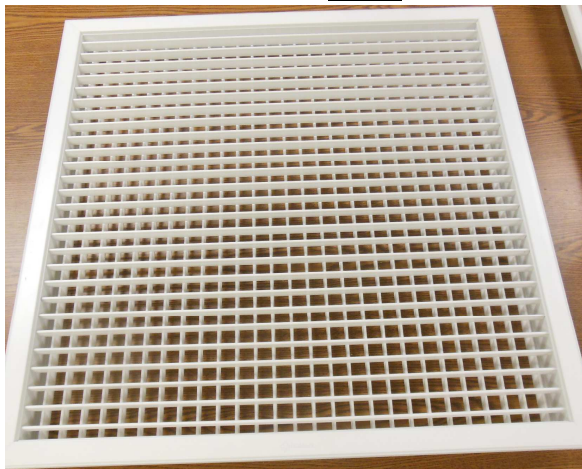
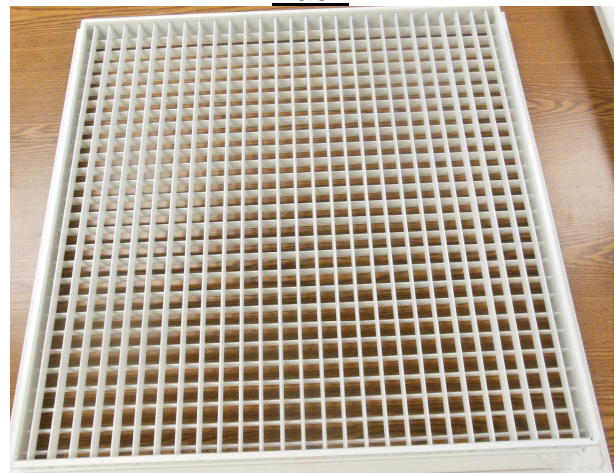
The grille was tested in accordance with the ASHRAE 70-2006 Standard "Method of Testing for Rating the Performance of Air Outlets and Inlets. Acoustical data was obtained employing a Bruel & Kjaer Pulse Digital Frequency Analyzer. The reference sound source used for this test was a calibrated Bruel & Kjaer Type 4204, which conforms to the above standard. The octave band sound power levels were plotted on graph of Noise Criteria Curves. These curves are reprinted with permission from the ASHRAE Handbook and Product Directory, 2017. The grille was installed in the facility and supplied with measured volumes of air. The static pressure was measured upstream of the sample. The testing was done with isothermal air.

**EQUIPMENT**

Equipment	Calibration Date	Due Date	S/N	Model	Asset
Microphone	11/3/2020	11/3/2021	-	4942	E450
Sound Analyzer	9/8/2020	9/8/2021	2706893	2270	A350
Reference Sound Source	10/12/2018	10/12/2021	2036621	4204	A230

**DESCRIPTION OF TEST SPECIMEN****MODEL DAG600 DOUBLE LAYER AIR GRILLE**

The sample consisted of a Double Layer Air Grille. The grille was equipped with fixed horizontal and vertical deflection blades. The 600 mm wide by 600 mm high by 50 mm deep sample was constructed from aluminum. The sample neck size was 550 mm by 550 mm. The testing was done using isothermal air.

**PHOTOGRAPHS OF TEST SAMPLE****Face****Back**

**RESULTS OF TESTS**

<u>Octave Band Center Frequency Hertz</u>	<b>MODEL DAG600 DOUBLE LAYER AIR GRILLE</b> <u>Discharge Sound Power Level dB re 10<sup>-12</sup> Watt</u>					
125	42.5	45.0	47.5	51.0	53.9	56.3
250	36.8	41.7	45.3	49.3	52.2	55.0
500	32.4	39.8	43.9	47.8	50.8	53.5
1000	25.3*	32.9	38.4	43.5	47.4	50.7
2000	21.0*	25.7	32.0	38.0	42.5	46.1
4000	18.8*	19.2*	22.7*	29.6	35.2	39.7
8000	23.1*	23.1*	23.2*	23.6*	25.8*	29.3
Supply Air Volume, CFM	1000	1200	1400	1600	1800	2000
Inlet Static Pressure, in. H <sub>2</sub> O	0.002	0.003	0.004	0.005	0.006	0.009
**Noise Criteria (NC)	16	24	28	33	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 DAG600 DOUBLE LAYER AIR GRILLE**

Throw Dir.: Horizontal				Neck Area (Sq. Ft.): 3.2							
Flow Meter: Nozzle Metering Station				Anemometer: Omega Digital Anemometer HHF5000							
				Serial Number: EX816329/1/15				Date: April 12, 2021			
Run											
Number	Anemometer - ( $V_k$ , FPM)				Static	Q2 Flow	Neck	Neck	Total	Area Fact.	
	1	2	3	4	Average	"H2O	CFM	Velocity	V.P.	Pressure	Ak
#1	149	140	142	146	144.25	0	250	78.13	0.0004	0.000	1.733
#2	225	200	210	222	214.25	0	375	117.19	0.0008	0.001	1.750
#3	303	282	292	293	292.5	0.001	515	160.94	0.0016	0.003	1.761
										Average:	1.748

### MODEL DAG600 DOUBLE LAYER AIR GRILLE

Distance	Star Asia Double Deflection										Air Volume		250 CFM	
From	Inlet Static Pressure					0.000 " H2O								
Ceiling	Distance From Diffuser (Ft)													
Inches	0'	2'	4'	6'	8'	10'	12'	14'	16'	18'	20'	22'	24'	
1"	7	29	50	50	47	54	48	50	50	43	35			
3"	4	40	58	56	65	67	60	60	57	52	45			
6"	12	66	63	61	73	68	66	61	57	50	42			
12"	89	92	81	74	77	70	60	56	51	41	32			
18"	78	102	97	88	60	59	54	45	38	31	17			
24"	109	104	82	70	48	37	37	33	23	17	13			
30.5"	17	54	53	43	42	32	28	28	15	12	6			

Distance	Star Asia Double Deflection										Air Volume		375 CFM	
From	Inlet Static Pressure					0.000 " H2O								
Ceiling	Distance From Diffuser (Ft)													
Inches	0'	2'	4'	6'	8'	10'	12'	14'	16'	18'	20'	22'	24'	
1"	10	39	65	73	81	81	71	73	71	67	56	56	38	
3"	11	64	86	85	96	99	91	94	91	83	70	67	45	
6"	16	99	104	98	103	106	99	97	92	81	77	73	51	
12"	125	136	122	137	120	109	106	92	86	69	76	64	54	
18"	133	151	157	139	120	96	84	70	72	60	60	50	51	
24"	171	156	136	98	98	68	56	46	60	42	47	38	44	
30.5"	23	85	71	48	59	42	42	42	53	38	43	32	39	

Distance	Star Asia Double Deflection										Air Volume		515 CFM	
From	Inlet Static Pressure					0.001 " H2O								
Ceiling	Distance From Diffuser (Ft)													
Inches	0'	2'	4'	6'	8'	10'	12'	14'	16'	18'	20'	22'	24'	
1"	22	58	88	92	110	100	105	96	94	97	90	86	73	
3"	24	83	109	109	127	120	125	123	120	118	113	104	91	
6"	28	127	125	129	143	135	134	128	129	114	106	103	95	
12"	164	177	166	177	166	165	132	118	117	91	87	81	83	
18"	183	190	199	181	159	137	120	93	83	58	65	58	66	
24"	223	211	175	137	121	90	88	63	59	39	42	51	50	
30.5"	30	113	103	88	90	56	73	48	35	25	29	35	45	

NOTE: All throw values are in feet per minute.  
The testing was done with isothermal air.

## 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: April 7 - 12, 2021

Report Approved by:



Brian Cyr  
Engineer  
Acoustical Testing

Report Reviewed By:



James R. Kline  
Engineer/Quality Supervisor  
Acoustical Testing

Attachments: None