



## 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 SAG600 Star Asia Single Layer Air Grille

A Single Layer Air Grille size 600 by 600 by 40 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 single layer air grille was tested for the following performance characteristics:  
"Reference Intertek Report Number 104519155CRT-001a 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-001a****STATIC PRESSURE, SOUND POWER LEVEL,  
AREA FACTOR AND THROW TESTS ON A  
MODEL SAG600 SINGLE 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 Single 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**

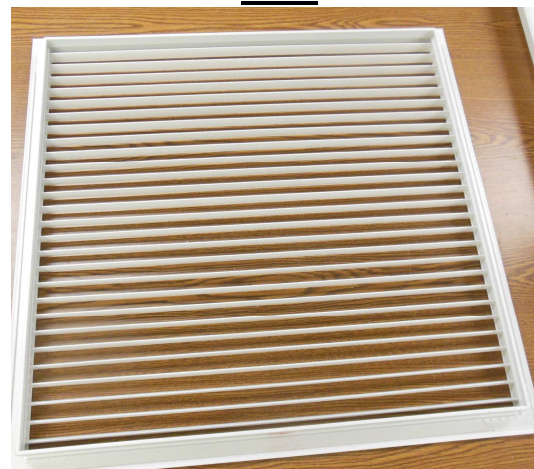
The grille was tested in accordance with the ASHRAE 70-2006 Standard "Method of Testing for Rating the Performance of Air Outlets and Inlets. Acoustical data was obtained employing a Bruel & Kjaer Pulse Digital Frequency Analyzer. The reference sound source used for this test was a calibrated Bruel & 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 SAG600 SINGLE LAYER AIR GRILLE**

The sample consisted of a Single Layer Air Grille. The grille was equipped with fixed horizontal single deflection blades. The 600 mm wide by 600 mm high by 40 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 SAG600 SINGLE LAYER AIR GRILLE</b> <u>Discharge Sound Power Level dB re 10<sup>-12</sup> Watt</u>					
125	39.3	44.2	42.0	45.6	48.9	54.0
250	34.4	37.8	39.7	44.0	47.2	52.8
500	26.5*	38.9	42.7	45.9	47.4	51.8
1000	23.4*	24.6*	30.0	40.6	46.5	53.1
2000	19.7*	20.0*	24.1	27.0	33.4	42.3
4000	18.6*	18.7*	18.7*	19.2*	22.0*	32.0
8000	23.1*	23.1*	23.1*	23.1*	23.3*	24.2
Supply Air Volume, CFM	800	1000	1200	1400	1600	2000
Inlet Static Pressure, in. H <sub>2</sub> O	0.001	0.002	0.003	0.004	0.005	0.008
**Noise Criteria (NC)	<15	23	27	31	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.

**AREA FACTOR  $A_k$**

**FOR AIR OUTLETS**

**MODEL SAG600 SINGLE 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 - (Vk, FPM)				Static	Q2 Flow	Neck	Neck	Total	Area Fact.	
	1	2	3	4	Average	"H2O	CFM	Velocity	V.P.	Pressure	Ak
#1	175	171	177	181	176	0	275	85.94	0.0004	0.000	1.563
#2	276	273	284	282	278.75	0	440	137.50	0.0011	0.001	1.578
#3	364	344	366	375	362.25	0.001	600	187.50	0.0021	0.003	1.656
										Average:	1.599

### MODEL SAG600 SINGLE LAYER AIR GRILLE

Distance From Ceiling	Star Asia Single 0° Deflection						Air Volume						275 CFM	
From Ceiling	Inlet Static Pressure						0.000 " H2O							
Inches	Distance From Diffuser (Ft)													
	0'	2'	4'	6'	8'	10'	12'	14'	16'	18'	20'	22'	24'	
1"	11	42	35	39	31	57	50	50	44	38				
3"	11	57	37	44	34	68	62	60	54	44				
6"	16	74	47	51	42	64	69	63	58	49				
12"	95	96	65	74	68	60	69	60	51	43				
18"	92	114	92	92	78	58	70	54	48	40				
24"	117	124	107	88	68	49	62	43	36	36				
30.5"	28	108	84	78	65	46	54	39	31	35				

Distance From Ceiling	Star Asia Single 0° Deflection						Air Volume						440 CFM	
From Ceiling	Inlet Static Pressure						0.000 " H2O							
Inches	Distance From Diffuser (Ft)													
	0'	2'	4'	6'	8'	10'	12'	14'	16'	18'	20'	22'	24'	
1"	16	61	59	69	83	80	73	77	74	67	47	46	32	
3"	16	76	71	85	95	89	90	94	93	83	63	55	37	
6"	22	101	91	104	94	91	102	93	93	81	66	54	47	
12"	166	154	136	132	115	104	111	90	86	64	68	52	48	
18"	176	181	167	143	132	124	102	81	81	58	63	54	45	
24"	186	206	174	129	114	107	92	77	69	44	55	50	42	
30.5"	42	169	141	105	91	90	85	69	69	40	52	51	48	

Distance From Ceiling	Star Asia Single 0° Deflection						Air Volume						600 CFM	
From Ceiling	Inlet Static Pressure						0.001 " H2O							
Inches	Distance From Diffuser (Ft)													
	0'	2'	4'	6'	8'	10'	12'	14'	16'	18'	20'	22'	24'	
1"	24	64	80	84	98	84	87	94	88	102	87	79	69	
3"	26	89	100	101	110	97	107	112	105	120	102	96	83	
6"	39	140	122	117	121	101	107	125	108	119	101	94	82	
12"	239	215	176	150	136	112	117	136	122	117	83	83	66	
18"	221	240	217	186	171	135	132	137	127	112	74	65	52	
24"	258	270	228	190	160	132	126	111	99	89	65	45	34	
30.5"	63	230	196	155	144	135	105	100	101	78	60	36	28	

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:

A handwritten signature in cursive script that reads "Brian Cyr".

Brian Cyr  
Engineer  
Acoustical Testing

Report Reviewed By:

A handwritten signature in cursive script that reads "James R. Kline".

James R. Kline  
Engineer/Quality Supervisor  
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Attachments: None