University of Illinois Department of Agricultural and Biological Engineering
Bioenvironmental and Structural Systems Lab
Final Report

Project Number: 20436
Test Date: November 24, 2020

Fan:
Make- *Chore-Time*
Model- *56911-3*
Blade dia.- *56.8"*
Orifice dia.- *57.3"*

Blade:
Number- *3*
Shape- *propeller*
Material- *galvanized steel*
Pitch- -
Clearance- *0.2"*

Drive Sheaves:
Drive dia.- *direct*
Axle dia.- *drive*

Motor:
Make- *Lafert*
Model- *HPS 90 625 41*
Hp- *2.06 kW*
RPM- *630*
Volts- *380-480*
Amps- *4.1*
Hz- -
Phase- *3*
S. F.- -

Housing:
Material- *Poly and galv. Steel*
Intake area- *55.9" x 55.9"*
Discharge- *57.3" dia.*
Depth- *22.5"*

Shutter: Butterfly damper
Material- *Poly*
Doors- *2*
Columns- -
Door length -
Location- *exhaust*

Guards:
Description- *wire*
Spacing- *1.3" x 2" / 5.5" concentric*
Location- *intake / exhaust*

Discharge Cone:
Depth- *34.8"*
Minor dia.- *56.6"*
Major dia.- *70"*

Notes: *speed control: Invertek Optidrive E3 ODE-3-140041-301A. Fan sub-assembly part no. 56911-1P*
Three phase 380V 50 Hz AC input to drive

Test Conditions:

T(wb):	55.5	Barometric pressure, recorded	29.30
T(db):	73	Barometric Pressure, corrected	29.18

Static Pressure (in.H2O)	Airflow (cfm)	rpm	Volts	Amps	Watts	cfm/Watt	SI Units Static Pressure (Pa)	Airflow (m^3/hr.)	(m^3/hr)/W	W/1000m^3/hr
42 Hz										
0.00	**35100**	633	380.9	2.35	1453	**24.1**	0	59600	41	24
0.05	**33400**	633	379.8	2.51	1544	**21.6**	12	56700	36.8	27
0.10	**31900**	633	378.1	2.69	1651	**19.3**	25	54200	32.8	30
0.15	**30500**	633	380.6	2.80	1733	**17.6**	37	51800	29.9	33
0.20	**28900**	633	379.3	2.96	1817	**15.9**	50	49000	27	37
0.25	**27100**	633	377.6	3.12	1915	**14.1**	62	46000	24	42
0.30	**24900**	633	376.8	3.25	1981	**12.6**	75	42300	21.4	47
0.35	**22700**	633	380.6	3.35	2067	**11.0**	87	38500	18.6	54
0.40	**18700**	633	380.3	3.45	2135	**8.8**	100	31800	14.9	67
38.3 Hz										
0.00	**32200**	578	380.8	1.83	1125	**28.6**	0	54800	48.7	21
0.05	**30500**	578	381.1	1.97	1218	**25.0**	12	51800	42.6	23
0.10	**29000**	579	381.3	2.10	1297	**22.3**	25	49300	38	26
0.15	**27100**	578	381.5	2.23	1381	**19.6**	37	46000	33.3	30
0.20	**25300**	578	381.4	2.36	1457	**17.3**	50	42900	29.5	34
0.25	**22800**	578	380.5	2.48	1529	**14.9**	62	38800	25.4	39
0.30	**20500**	579	379.8	2.58	1592	**12.9**	75	34800	21.9	46
0.35	**16100**	578	378.9	2.66	1638	**9.8**	87	27400	16.7	60
33.3 Hz										
0.00	**28400**	503	380.0	1.25	764	**37.1**	0	48200	63.1	16
0.05	**26400**	503	380.3	1.38	847	**31.2**	12	44900	53.1	19
0.10	**24500**	503	380.5	1.49	915	**26.8**	25	41600	45.5	22
0.15	**22300**	503	380.7	1.59	983	**22.7**	37	37900	38.5	26
0.20	**19800**	503	380.8	1.69	1045	**19.0**	50	33700	32.3	31
0.25	**16300**	503	381.1	1.77	1091	**14.9**	62	27700	25.4	39
0.30	**11700**	503	381.2	1.85	1146	**10.2**	75	19900	17.3	58
28.3 Hz										
0.00	**24400**	428	379.4	0.81	491	**49.8**	0	41500	84.6	12
0.05	**22100**	428	379.6	0.91	555	**39.9**	12	37600	67.8	15
0.10	**19500**	428	379.8	1.01	614	**31.8**	25	33200	54.1	18
0.15	**16400**	428	379.9	1.09	664	**24.7**	37	27900	42.1	24
23.3 Hz										
0.00	**19300**	352	379.0	0.52	297	**65.0**	0	32800	110.4	9
0.05	**16400**	352	379.1	0.59	350	**46.7**	12	27800	79.4	13
0.10	**12200**	352	379.4	0.64	385	**31.7**	25	20700	53.9	19
0.12	**10000**	352	379.3	0.64	385	**26.0**	30	17000	44.1	23