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

Project Number: 22228
Test Date: April 26, 2022

Fan:		Motor:		Shutter:	
Make-	Better Air	Make-	AG-I	Material-	plastic
Model-	18" ECM	Model-	ECN48B13BNZ1/EC06F	# Doors-	6
Blade dia.-	18.1"	Hp-	375 Watt	# Columns-	1
Orifice dia.	18.6"	RPM-	1800	Door lengtl	19.2"
		Volts-	115 / 230	Location-	intake
Blade:		Amps-	5.43 / 3.2		
Number-	6	Hz-	-	Guards:	
Shape-	propeller	Phase-	-	Descriptior	wire
Material-	plastic	S. F.-	-	Spacing-	2" concentric
Pitch-	-			Location-	exhaust
Clearance-	0.3"	Housing:			
		Material-	plastic	Discharge Cone:	
Drive Sheaves:		Intake area	18.4" x 18.4"	Depth-	16.4"
Drive dia.-	direct	Discharge-	18.6" dia.	Minor dia.-	18.6"
Axle dia.-	drive	Depth-	27.5" top 24" bottom	Major dia.-	28" dia.

Notes: * 230 VAC, 1 phase, 60 Hz input to motor. Speed controlled with single turn potentiometer

Test Conditions:

T(wb) F:	60	Barometric pressure, recorded	29.61	
T(db) F:	75	Barometric Pressure, corrected	29.49	(In. Hg)

Static Pressure (in.H2O)	Airflow (cfm)	rpm	Volts	Amps	Watts	cfm/Watt	SI Units Static Pressure (Pa)
Full speed							
0.00	3850	1810	229.6	2.41	303	12.7	0
0.05	3750	1811	229.8	2.45	309	12.1	12
0.10	3630	1812	229.8	2.49	316	11.5	25
0.15	3490	1812	229.8	2.51	318	11.0	37
0.20	3240	1811	230.1	2.52	321	10.1	50
0.25	3020	1811	230.2	2.53	321	9.4	62
0.30	2780	1811	230.2	2.52	321	8.7	75
1650 rpm							
0.00	3530	1655	230.1	1.91	237	14.9	0
0.05	3400	1655	230.1	1.94	242	14.1	12
0.10	3260	1655	230.2	1.97	246	13.3	25
0.15	3030	1655	230.2	1.99	247	12.3	37
0.20	2770	1655	230.1	2.00	251	11.0	50

0.25	2520	1655	229.8	1.99	248	10.2	62
0.30	2240	1654	229.8	2.01	251	8.9	75
1545 rpm							
0.00	3300	1547	230.3	1.61	194	17.0	0
0.05	3150	1546	230.2	1.64	200	15.8	12
0.10	2990	1546	230.5	1.66	202	14.8	25
0.15	2700	1546	230.2	1.67	205	13.2	37
0.20	2440	1545	230.0	1.67	204	12.0	50
0.25	2150	1545	230.2	1.69	207	10.4	62
1270 rpm							
0.00	2700	1274	230.1	0.98	115	23.4	0
0.05	2500	1274	230.2	1.00	119	21.0	12
0.10	2170	1274	229.9	1.02	119	18.3	25
0.15	1820	1274	230.2	1.05	123	14.8	37
0.20	1360	1273	230.2	1.13	133	10.2	50
0.25	1160	1273	230.2	1.18	141	8.2	62
905 rpm							
0.00	1760	904	230.2	0.43	49	35.8	0
0.05	1320	904	230.2	0.46	50	26.4	12
0.10	880	904	230.5	0.50	57	15.4	25
0.15	510	904	230.4	0.52	57	9.0	37
0.20	250	904	230.0	0.53	58	4.4	50
450 rpm							
0.00	460	454	230.7	0.13	13	35.7	0
0.02	240	454	230.4	0.13	13	18.5	5

Airflow (m^3/hr.)	(m^3/hr)/W	W/1000m^3/hr
6500	21.6	46
6400	20.6	49
6200	19.5	51
5900	18.6	54
5500	17.2	58
5100	16	63
4700	14.7	68
6000	25.3	40
5800	23.9	42
5500	22.5	44
5200	20.9	48
4700	18.7	53

4300	17.3	58
3800	15.2	66
5600	28.9	35
5400	26.8	37
5100	25.1	40
4600	22.4	45
4200	20.4	49
3700	17.7	57
4600	39.8	25
4200	35.7	28
3700	31	32
3100	25.1	40
2300	17.4	57
2000	14	72
3000	60.9	16
2200	44.8	22
1500	26.2	38
900	15.3	66
400	7.4	134
800	60.6	16
400	31.4	32