

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

Project Number: 24220
 Test Date: April 11, 2024

Fan:	Motor:	Shutter:
Make- <i>Better Air</i>	Make- <i>AG-1</i>	Material- <i>plastic</i>
Model- <i>LPEC-3801 w/cone</i>	Model- <i>ECN48B10CN/EC10</i>	# Doors- <i>12 per column</i>
Blade dia.- <i>36.5"</i>	Hp- <i>1.0</i>	# Columns- <i>2</i>
Orifice dia.- <i>37"</i>	RPM- <i>300 - 900</i>	Door length <i>20.5"</i>
	Volts- <i>115 / 230</i>	Location- <i>intake</i>
Blade:	Amps- <i>9.8 / 5.8</i>	Guards:
Number- <i>3</i>	Hz- <i>60</i>	Description- <i>wire</i>
Shape- <i>propeller</i>	Phase- <i>1</i>	Spacing- <i>2" concentric</i>
Material- <i>poly</i>	S. F.- <i>1.0</i>	Location- <i>exhaust</i>
Pitch- <i>-</i>	Housing:	Discharge Cone:
Clearance- <i>0.3"</i>	Material- <i>poly</i>	Depth- <i>18"</i>
Drive Sheaves:	Intake area- <i>40.5" x 40.5"</i>	Minor dia.- <i>37"</i>
Drive dia.- <i>direct</i>	Discharge- <i>37" dia.</i>	Major dia.- <i>43"</i>
Axle dia.- <i>drive</i>	Depth- <i>32" top</i>	
	<i>28.8" bottom</i>	

Notes: *60 Hz test. Blade angle: purple angle ring

Test Conditions:

T(wb) F: 57.1
 T(db) F: 71.4
 Barometric Pressure 28.75 (In. Hg)

							SI Units			
Static Pressure (in.H2O)	Airflow (cfm)	rpm	Volts	Amps	Watts	cfm/Watt	Static Pressure (Pa)	Airflow (m ³ /hr.)	(m ³ /hr)/W	W/1000m ³ /hr
100 % speed										
0.00	12260	856	230.0	4.62	607	20.2	0	20800	34.3	29
0.05	11630	855	230.0	4.76	629	18.5	12	19800	31.4	32
0.10	10840	855	229.8	4.89	651	16.7	25	18400	28.3	35
0.15	10090	855	229.9	4.99	666	15.1	37	17100	25.7	39
0.20	8750	855	230.0	5.04	670	13.1	50	14900	22.2	45
0.25	7660	855	230.0	4.99	664	11.5	62	13000	19.6	51
0.30	6090	855	230.0	4.93	658	9.3	75	10400	15.7	64
80% speed										
0.00	9760	681	230.4	2.60	317	30.8	0	16600	52.3	19
0.05	8840	681	230.4	2.70	334	26.5	12	15000	45	22
0.10	7470	681	230.4	2.78	351	21.3	25	12700	36.2	28
0.15	5910	682	230.4	2.74	343	17.2	37	10000	29.3	34
0.20	4330	681	230.4	2.72	342	12.7	50	7400	21.5	47
0.25	2740	681	230.4	2.80	352	7.8	62	4700	13.2	76
70% speed										
0.00	8290	595	230.9	1.85	220	37.7	0	14100	64	16
0.05	7170	595	230.8	1.96	237	30.3	12	12200	51.4	19
0.10	5530	595	230.9	1.95	236	23.4	25	9400	39.8	25
0.15	3560	595	230.4	1.91	229	15.5	37	6000	26.4	38
0.20	1930	595	230.4	1.97	237	8.1	50	3300	13.8	72
60% speed										
0.00	6840	511	230.0	1.28	150	45.6	0	11600	77.5	13
0.05	5110	511	230.0	1.34	156	32.7	12	8700	55.6	18
0.10	3090	512	230.0	1.31	150	20.6	25	5300	35	29
0.13	1990	511	230.0	1.31	151	13.2	32	3400	22.4	45