

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

Project Number: 17224  
 Test Date: March 22, 2017

|                                   |                                   |                                         |
|-----------------------------------|-----------------------------------|-----------------------------------------|
| <b>Fan:</b>                       | <b>Motor:</b>                     | <b>Shutter:</b>                         |
| Make- <i>Chore-Time</i>           | Make- <i>GE</i>                   | Material- <i>Butterfly damper</i>       |
| Model- <i>53464-23</i>            | Model- <i>5KCR48WN0711T</i>       | # Doors- <i>2</i>                       |
| Blade dia.- <i>56.8"</i>          | Hp- <i>1.5</i>                    | # Columns- <i>-</i>                     |
| Orifice dia.- <i>57.3"</i>        | RPM- <i>1725</i>                  | Door length -                           |
|                                   | Volts- <i>208 - 230</i>           | Location- <i>exhaust</i>                |
| <b>Blade:</b>                     | Amps- <i>6.5 - 6.6</i>            |                                         |
| Number- <i>3</i>                  | Hz- <i>60</i>                     | <b>Guards:</b>                          |
| Shape- <i>Propeller</i>           | Phase- <i>1</i>                   | Description- <i>wire</i>                |
| Material- <i>galvanized steel</i> | S. F.- <i>1.1</i>                 | Spacing- <i>2"x4" / 5.5" concentric</i> |
| Pitch- <i>-</i>                   |                                   | Location- <i>intake / exhaust</i>       |
| Clearance- <i>0.4"</i>            | <b>Housing:</b>                   |                                         |
|                                   | Material- <i>Poly</i>             | <b>Discharge Cone:</b>                  |
| <b>Drive Sheaves:</b>             | Intake area- <i>57.5" x 57.5"</i> | Depth- <i>34.8"</i>                     |
| Drive dia.- <i>3.0" o.d.</i>      | Discharge- <i>57.3"</i>           | Minor dia.- <i>57.3"</i>                |
| Axle dia.- <i>9.9" o.d.</i>       | Depth- <i>10.5"</i>               | Major dia.- <i>69.8"</i>                |

Notes: *With 20" diameter wind deflector.*

**Test Conditions:**

|             |                                |                |
|-------------|--------------------------------|----------------|
| T(wb) F: 53 | Barometric pressure, recorded  | 29.77          |
| T(db) F: 77 | Barometric Pressure, corrected | 29.64 (In. Hg) |

|                          |               |     |       |      |       |          | SI Units             |                               |                        |                          |
|--------------------------|---------------|-----|-------|------|-------|----------|----------------------|-------------------------------|------------------------|--------------------------|
| Static Pressure (in.H2O) | Airflow (cfm) | rpm | Volts | Amps | Watts | cfm/Watt | Static Pressure (Pa) | Airflow (m <sup>3</sup> /hr.) | (m <sup>3</sup> /hr)/W | W/1000m <sup>3</sup> /hr |
| 0.00                     | 24600         | 540 | 229.8 | 3.39 | 768   | 32.1     | 0                    | 41900                         | 54.5                   | 18                       |
| 0.05                     | 23000         | 539 | 229.8 | 3.58 | 816   | 28.2     | 12                   | 39100                         | 47.9                   | 21                       |
| 0.10                     | 21200         | 539 | 229.6 | 3.79 | 862   | 24.6     | 25                   | 36000                         | 41.7                   | 24                       |
| 0.15                     | 18900         | 538 | 229.3 | 4.00 | 912   | 20.8     | 37                   | 32200                         | 35.3                   | 28                       |
| 0.20                     | 16400         | 537 | 229.3 | 4.17 | 953   | 17.3     | 50                   | 27900                         | 29.3                   | 34                       |
| 0.25                     | 13100         | 536 | 229.3 | 4.32 | 990   | 13.2     | 62                   | 22200                         | 22.4                   | 45                       |
| 0.30                     | 9800          | 536 | 229.3 | 4.45 | 1018  | 9.6      | 75                   | 16600                         | 16.3                   | 61                       |