

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

**Project Number:** 07229  
**Test Date:** May 22, 2007

**Fan:**

Make- *American Coolair*  
 Model- *NBRID52M-SQ*  
 Blade dia.- *53"*  
 Orifice dia.- *53.8"*

**Blade:**

Number- *4*  
 Shape- *propeller*  
 Material- *steel, painted*  
 Pitch- *-*  
 Clearance- *0.4"*

**Drive Sheaves:**

Drive dia.- *AK39, 3.8" o.d.*  
 Axle dia.- *11.4" o.d.*

**Motor:**

Make- *Emerson*  
 Model- *T63ZZCDZ-1257*  
 Hp- *1.5*  
 RPM- *1725/1425*  
 Volts- *115/208-230*  
 Amps- *13.2/6.7//15.5/7.8*  
 Hz- *60/50*  
 Phase- *1*  
 S. F.- *1.5*

**Housing:**

Material- *galvanized steel*  
 Intake area- *57.3" x 57.3"*  
 Discharge- *53.8" dia.*  
 Depth- *25.8"*

**Shutter:**

Material- *galvanized steel*  
 # Doors- *4*  
 # Columns- *-*  
 Door length *54" vertical*  
 Location- *intake*

**Guards:**

Description- *wire*  
 Spacing- *2"x2"/2" concentric*  
 Location- *intake/exhaust*

**Discharge Cone:**

Depth- *32.4"*  
 Minor dia.- *53.8"*  
 Major dia.- *64.8"*

**Notes:** *0*

**Test Conditions:**

|        |      |                                |       |
|--------|------|--------------------------------|-------|
| T(wb): | 62.5 | Barometric pressure, recorded  | 29.48 |
| T(db): | 80   | Barometric Pressure, corrected | 29.34 |

| <b>Static Pressure<br/>(in.H2O)</b> | <b>Airflow<br/>(cfm)</b> | <b>rpm</b> | <b>Volts</b> | <b>Amps</b> | <b>Watts</b> | <b>cfm/Watt</b> |
|-------------------------------------|--------------------------|------------|--------------|-------------|--------------|-----------------|
| <b>0.00</b>                         | <b>29800</b>             | 558        | 230.1        | 6.17        | 1349         | <b>22.1</b>     |
| <b>0.05</b>                         | <b>28600</b>             | 556        | 230.4        | 6.49        | 1417         | <b>20.2</b>     |
| <b>0.10</b>                         | <b>27300</b>             | 554        | 230.4        | 6.78        | 1491         | <b>18.3</b>     |
| <b>0.15</b>                         | <b>25600</b>             | 552        | 230.5        | 7.10        | 1563         | <b>16.4</b>     |
| <b>0.20</b>                         | <b>24100</b>             | 551        | 230.4        | 7.40        | 1624         | <b>14.8</b>     |
| <b>0.25</b>                         | <b>22000</b>             | 549        | 230.0        | 7.73        | 1702         | <b>12.9</b>     |
| <b>0.30</b>                         | <b>19900</b>             | 547        | 230.0        | 8.01        | 1760         | <b>11.3</b>     |