

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

**Project Number:** 07230  
**Test Date:** May 22, 2007

**Fan:**

Make- *American Coolair*  
 Model- *NBRID52L-SQ*  
 Blade dia.- *53"*  
 Orifice dia.- *53.8"*

**Blade:**

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

**Drive Sheaves:**

Drive dia.- *MA33, 3.3" o.d.*  
 Axle dia.- *11.4" o.d.*

**Motor:**

Make- *Emerson*  
 Model- *T63ZZBBA-800*  
 Hp- *1*  
 RPM- *1725*  
 Volts- *115/208-230*  
 Amps- *11.0/5.5*  
 Hz- *60*  
 Phase- *1*  
 S. F.- *1.3*

**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 | Barometric pressure, recorded  | 29.48 |
| T(db): | 78 | Barometric Pressure, corrected | 29.35 |

| <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> |
|-------------------------------------|--------------------------|------------|--------------|-------------|--------------|-----------------|
| 0.00                                | 26300                    | 486        | 230.3        | 4.99        | 957          | 27.5            |
| 0.05                                | 24600                    | 484        | 230.4        | 5.25        | 1015         | 24.3            |
| 0.10                                | 23000                    | 483        | 229.8        | 5.51        | 1076         | 21.3            |
| 0.15                                | 21100                    | 481        | 230.0        | 5.78        | 1137         | 18.6            |
| 0.20                                | 18800                    | 479        | 230.0        | 6.05        | 1198         | 15.7            |
| 0.25                                | 15600                    | 477        | 230.0        | 6.31        | 1261         | 12.4            |
| 0.30                                | 12000                    | 476        | 229.9        | 6.51        | 1311         | 9.2             |