

03

Why measure fan capacity?

- If fan capacity is impaired ventilation will be inadequate and bird performance may be affected.
- Measuring air speed through the fan or measuring fan revolutions per minute (RPM) will determine whether or not fans are working correctly and are in line with manufacturers' specifications.



03
Capacity
Fan Measure

Why measure fan capacity?

Procedure for measuring fan capacity

Equipment

1. Digital tachometer and / or anemometer.

Procedure

Fan capacity should be measured on a regular basis (at least once a flock) to ensure fans continue to work correctly. Fan capacity should also be checked when issues with ventilation occur or if there are concerns about fan function.

Procedure for measuring fan capacity with a digital tachometer (RPM)

Step 1 Open all air inlets and doors fully.

Step 2 If fan blades are plastic a reflective sticker will need to be placed approximately 5 - 7 cm (2 – 3 in) from the tip of the blade.



Step 1

Step 3 Turn on the fan to be tested. All fans should be tested individually and at full speed.



Step 4

Step 4 Holding the meter still 0.6 - 1.0 m (2 - 3 ft) away from the fan and at a slight angle point the laser at the sticker or directly at one blade if blades are reflective / metal, until the reading on the tachometer becomes constant.

Step 5 Compare fan RPM with manufacturers specifications.

Note *If the fan has reflective / metal blades the recording on the tachometer must be divided by the number of blades the fan has. The RPM should be within manufacturer's guidelines or the guidelines set by an independent testing facility.*

Procedure for measuring fan capacity with an anemometer (air speed through the fan)

Step 1 Open all air inlets and doors fully.



Step 1

Step 2 Turn on the fan to be tested. All fans should be tested individually and at full speed.



Step 3

Step 3 Hold the meter in front of the fan and record the **average** air speed through the fan.



Step 4

Step 4 Average fan speed should be measured at 9 locations across the area of measurement. Average fan speed is the average of all 9 measurements or the speed obtained using the average setting (if applicable) on the air speed meter.

Step 5 Compare fan capacity with manufacturers specifications.

Example calculation for fan capacity:

Fan capacity (m^3 / hr) = average air speed (m / s) x area (height x width) through which air speed has been measured (m^2)

$$\text{Average air speed} = 4 \text{ m} / \text{s}$$

$$\begin{aligned} \text{Average air speed} (\text{m} / \text{hr}) &= 4 \times 3600 \\ &= 14400 \end{aligned}$$

$$\begin{aligned} \text{Area of measurement} (\text{h} \times \text{w}) &= 1.2 \times 1.2 \\ &= 1.44 \text{ m}^2 \end{aligned}$$

$$\begin{aligned} \text{Fan capacity} &= 14400 \times 1.44 \\ &= 20,736 \text{ m}^3 / \text{hr} \end{aligned}$$

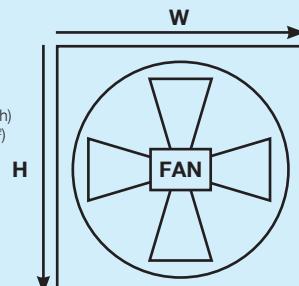
Fan Capacity (ft^3 / min) = Average air speed (ft / min) x area (height x width) through which air speed has been measured (ft^2)

$$\text{Average air speed} = 787 \text{ ft} / \text{min}$$

$$\begin{aligned} \text{Area of measurement} (\text{ft}^2) &= 3.93 \times 3.93 \\ &= 15.45 \text{ ft}^2 \end{aligned}$$

$$\begin{aligned} \text{Fan Capacity} (\text{ft}^3 / \text{min}) &= 787 \times 15.45 \\ &= 12,159 \text{ ft}^3 / \text{min} \end{aligned}$$

Area of Measurement



Interpreting results

If fan capacity is below manufacturers specifications check all air inlets and doors are open fully and re-measure fan capacity.

If fan capacity is still below manufacturers specifications fan maintenance will be required.

Areas to check if fan capacity is below specifications.

Area	What to look for	Action
Bearing and motors [†]	Worn bearings, noise, and / or smell	Ensure bearings are properly greased or replace bearings
Fan blades	Are they smooth, or damaged / twisted	Replace any damaged blades
Fan belts [‡]	Tightness, movement and wear	Adjust belt tensioner or replace belt [‡]
Pulleys	Wear and tear, noise	Grease properly and replace if needed
Louvers and cages	Ease of movement, cleanliness, obstruction?	Grease louver doors to ensure free movement, remove any obstructions
Wattage	Reduced fan speed / capacity	Get a qualified electrician



[†]Checking bearings and motors



[‡]Worn fan belt



[‡]Loose fan belt