

ADJUSTABLE PITCH WHEELS

Chicago's Axial Airfoil wheels for direct drive applications feature advanced design, high efficiency, quiet performing adjustable pitch blades. These versatile wheels are available with 3, 4, 6, 9, or 12 blades, infinitely adjustable to any pitch to provide the fine tuning needed to meet precise OEM performance requirements. Optimum wheel selections are quickly assembled from stock components to supply custom wheels with no added expense or extended lead time.

Optional special wheel diameters are also available to provide additional performance flexibility as well as the dimensional adaptability to accommodate exact OEM equipment physical parameters.



Unique Airfoil Blades

The exceptional performance of Chicago's Design 37 wheels is the result of superior airfoil blading combined with advanced production technology. Efficient design requires uniform air flow along the entire length of the blade, even though the tip of the blade travels faster than the base, or root.

To compensate for these lower root speeds, airfoil blade pitch angle and lift characteristics must continuously change from tip to root to maintain equal air distribution along the length of the blade.

The resulting intricate flowing shapes are then precisely duplicated by the injection molding process using engineering grade high-strength resins to assure accurate and consistent performance.

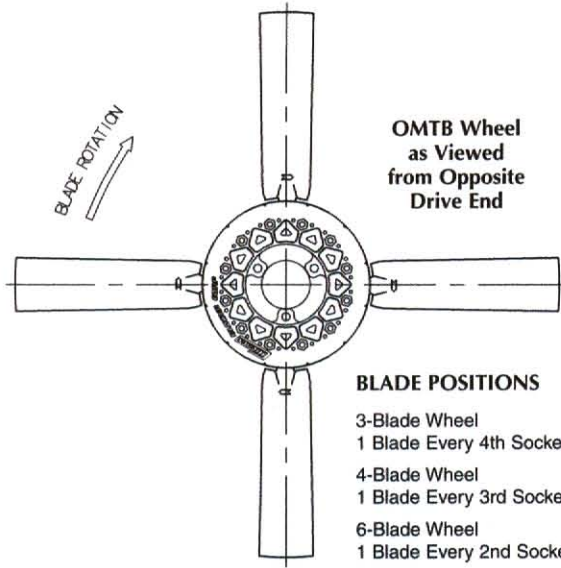
Meet Exact OEM Duty Requirements



Accurate Blade Adjustment

The two-piece hub (size 20 and larger) firmly grips the entire blade shank. By loosening the hub fasteners, the hub releases its hold on the blade and allows the blade to be rotated as needed to change the pitch while retaining the blade within the hub. Blades can be adjusted in the field in a matter of minutes. A convenient pitch setting card assures accurate setting.

Dimensions (inches)



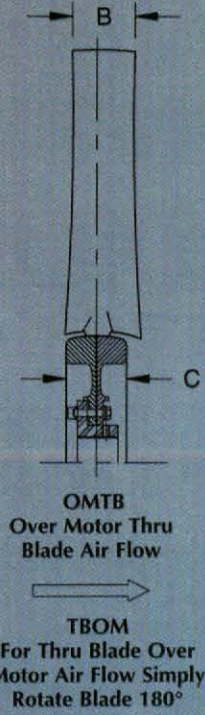
BLADE POSITIONS

- 3-Blade Wheel
1 Blade Every 4th Socket
- 4-Blade Wheel
1 Blade Every 3rd Socket
- 6-Blade Wheel
1 Blade Every 2nd Socket
- 9-Blade Wheel
Every 4th Socket Empty
- 12-Blade Wheel
No Empty sockets

Hub Series	Nom. Size	Wheel Dia.	B Max.	C
II	14	13-7/8	1-5/8	1-1/8
	16	15-9/16		
	18	17-17/32		
III	20	19-15/32	2-1/4	1-9/16
	22	21-13/16		
	24	24-17/32		
IV	28	27-13/16	3-7/32	2-1/4
	32	31-3/16		
	36	35-1/16		
V	40	38-31/32	4-1/2	3-3/16
	44	43-5/8		
	48	49-3/32		

Series II wheels are fixed pitch with one-piece hub and blades solvent bonded to hub.

Series III, IV and V wheels are adjustable pitch with two-piece hubs.



Selecting Special Diameter Axial Airfoil Wheels

Special diameter wheels are available to meet exact OEM physical requirements. Estimate special diameter wheel performance as follows:

- Specify special diameter in inches and required CFM and SP at standard air conditions.
- Standard Diameter = next standard diameter larger than special diameter.
- Determine size ratio: $SR = \frac{\text{Special Diameter}}{\text{Standard Diameter}}$
- Determine standard diameter duty to meet special diameter duty:

$$\text{Standard CFM} = \frac{\text{Special CFM}}{SR^3}$$

$$\text{Standard SP} = \frac{\text{Special SP}}{SR^2}$$

- Select standard fan for above Standard CFM and Standard SP using Design 37 PANEL FAN or Design 37 TUBE AXIAL computer programs or performance tables.
- Determine Special BHP:
Special BHP = Standard BHP x SR⁵

EXAMPLE:

- Special diameter:** 42"
Duty: 26,000 CFM @ 0.375" SP @ standard air
- Standard Diameter:** 43.625" (size 44)
- Size ratio:** $SR = \frac{42}{43.625} = 0.9627507$
- Determine standard diameter duty to meet special diameter duty:**
Standard CFM = $\frac{26,000}{0.9627507^3} = \frac{26,000}{0.8923630} = 29,136$
Standard SP = $\frac{0.375}{0.9627507^2} = \frac{0.375}{0.9268889} = 0.40457$
- Select standard fan for above Standard CFM and Standard SP using Design 37 Panel Fan or Design 37 TUBE AXIAL computer programs or performance tables.

EXAMPLE:

Highest Efficiency:	DCP-44-9EF-7-1/2-870		
	CFM	SP	BHP
	29136	0.40	5.91

- Determine Special BHP:**

$$\begin{aligned} \text{Special BHP} &= 5.91 \times 0.9627507^5 \\ &= 5.91 \times 0.8271213 \\ &= 4.89 \end{aligned}$$

Special wheel model 42-9EF-5-870

Estimated performance: 26,000 CFM @ 0.375" SP @ standard air, 4.89 BHP



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