

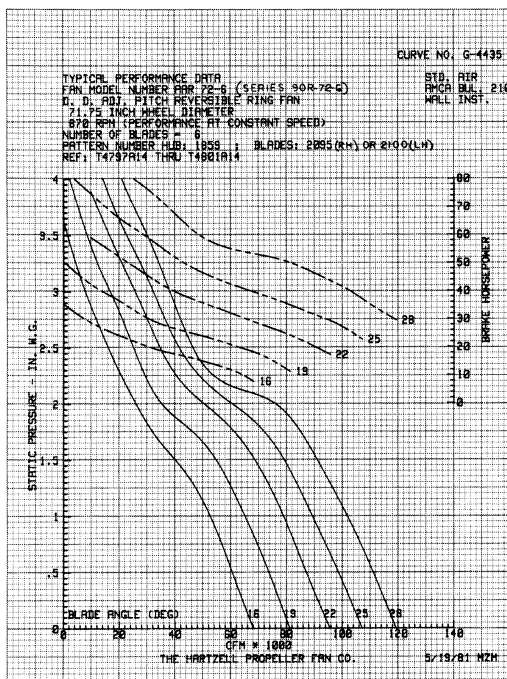
## Construction Features:

- **Airfoil Section** – Blade design is a field-proven Hartzell airfoil, modified such that the leading edges and the trailing edges of the blades are identical in either direction of rotation. The result is 100% airflow in reverse rotation.
- **Sizes** – 48" - 84" diameter, 4-blade and 6-blade design.
- **All Aluminum Construction** – Blades are alloy #319 aluminum, sand cast, ground to satin finish for balance; or permanent mold, depending on size. Hubs are permanent mold castings ground to satin finish for balance. U-bolts are S.A.E. Grade 5 U-bolts; cadmium plated with Class 2A thread. NOTE: When assembly is used for hardwood kiln applications, 304 Stainless hardware must be used (U-bolts, nuts, washers, and backing plate.)
- **Taper Lock Bushing** – Refer to drawing on reverse side for bore and key ranges.
- **Drop-in Blade Retention; Manual Adjustment** – Blades have a retention shoulder which fits into a recess in the hub to ensure proper location. Design does not require accessory port in the fan orifice to assemble the blades.
- **Balance** – Blades and hubs are statically balanced against a master. (Dynamic balancing of complete assemblies, with match-mark indexing is optional.)
- **Maximum Tip Speed** – 17,000 FPM.

## Performance:

- **Air Flow** – 100%, either direction.
- **Air Volume** – 12,000 to 150,000 CFM at free air.
- **Static Pressure** – Efficient operation ranges from free air through 2" W.G. (at 0.075-lbs./ft.<sup>3</sup> density).
- **Efficiency** – Hartzell Series 90R adjustable pitch reversible features maximum static efficiencies of 58% and maximum total efficiencies of 73%.
- **Testing Methods** – Series 90R adjustable pitch reversible fans have been tested for sound and air performances in Hartzell's AMCA registered laboratory. Product performance data based on tests in an AMCA registered laboratory are not to be construed as being licensed to bear the AMCA Seal.

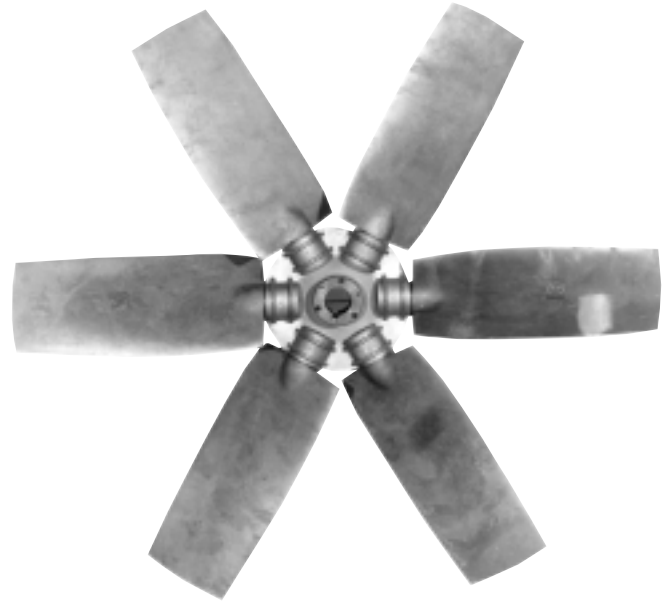
## Typical Fan Performance



Fan Performance Curves and Complete Sound Data are Available Upon Request

Hartzell Fan, Inc. • Piqua, Ohio 45356  
www.hartzellfan.com

## Series 90R/90U Aluminum Adjustable Pitch Reversible Fan Assembly



AAR BLADE

## Design Features:

- **Stable Performance** – Under varying pressures without stall is characterized by the typical performance curve illustrated on this page.
- **Standard Rotation** – is right-hand. The 72" and 84" sizes are available in left-hand rotation.
- **Maximum Temperature** – 300°F 149°C.
- **Coatings** – Special coatings for application of Hartzell blades in corrosive atmospheres are available.
- **Shipment** – Series 90R fans are shipped knocked down as standard. Shipment of complete assembly is available upon request.

## Ultra High Temperature Construction (Optional):

- **Maximum Temperature** – 400°F 204°C.
- **Performance** – Same stable, efficient airfoil design and shape utilized in standard construction. (See previous section).
- **Airfoil Construction** – 100% reversible airfoil cast in A240.1 aluminum alloy. Static balanced against a master is standard. Dynamic balancing is optional.
- **Hub Construction** – Hub is fabricated, painted, high strength steel. Same drop-in blade retention as standard design.
- **Taper Lock Bushing** – For easy installation and removal. Carbon steel standard; stainless steel optional.
- **Maximum Tip Speed** – 18,500 FPM.
- **Sizes** – 60" & 72", 4-blade and 6-blade available.

## Principal Dimensions

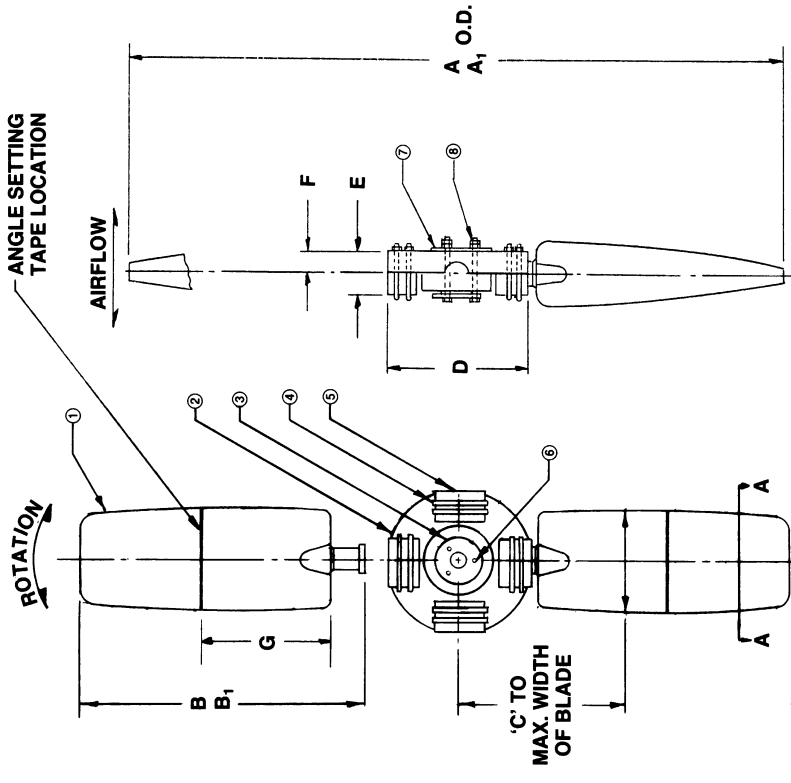
Fan Size	48	54	60	72	84
A	48 1/2	54 3/4	60 3/4	72	84
A <sub>1</sub>	47 3/4	53 5/8	59 5/8	71	83
B	21 5/8	24	26	31 5/8	37 5/8
B <sub>1</sub>	21 1/4	23 7/16	25 5/16	31 1/8	37 1/8
C	12 1/8	13 11/16	15 3/16	12 3/4	12 3/4
D	10 1/2	12 1/4	15 3/4	15 3/4	15 3/4
E	3 1/8	3 5/8	4 1/4	4 1/4	4 1/2
F	1 9/16	1 13/16	2 3/32	2 9/32	2 9/32
G	10 7/16	11 1/2	11 11/16	15 9/16	15 9/16
Max. Width of Blade	7 1/2	8 1/2	10 7/16	11 5/16	11 5/16
Fan Size	48	54	60	72	84
Blade Pattern	RH	2129	2297	2303	2184
LH	-	-	-	2100	2185
Blade Weight	8.3	11.6	14.1	22.2	26
Hub Pattern	(4)	1775	1834	1858	1858
(6)	1776	1835	1859	1859	1859
Hub Weight	(4)	15	22.5	57	57
(6)	17	24	61	61	61
Ultra Hi-Temp Hub Pattern	(4)	-	D497	D497	-
(6)	-	-	D497	D497	-
Ultra Hi-Temp Hub Weight	(4)	-	66	66	-
(6)	-	-	72	72	-
Bushing	Q2	Q2	R2	R2	R2
Max. Bore	2 5/8	2 5/8	3 5/8	3 5/8	3 5/8
Ass'y Wgt.	(4)	48	69	146	161
(6)	67	94	146	194	217
WR <sup>2</sup> Lb.	(4)	31.3	54.6	119.5	211.0
Ft. <sup>2</sup>	(6)	46.5	80.3	219.4	310.6
Blade					435.7

### Safety Accessories Warning

The responsibility for providing safety accessories for equipment supplied by Hartzell Fan, Inc. is that of the installer and user of this equipment. Hartzell Fan, Inc. sells its equipment with and without safety accessories, and accordingly, it can supply such safety accessories upon receipt of order.

The user, in making its determination as to the appropriate safety accessories to be installed and any warning notices, should consider (1) the location of the installation, (2) the accessibility of employees and other persons to this equipment, (3) any adjacent equipment, (4) applicable building codes, and (5) requirements of the federal Occupational Safety and Health Act.

Users and installers of this equipment should read "RECOMMENDED SAFETY PRACTICES FOR AIR MOVING DEVICES" which is published by Air Movement and Control Association, 30 West University Drive, Arlington Heights, Illinois 60004. A copy of this publication is enclosed with the inspection report accompanying equipment shipped from Hartzell Fan, Inc. and is also available at its office in Piqua, Ohio 45356, upon request.



### NOTES:

- 4-Blade Assy. Shown, Available in 6 Blade.
- Use 'A' & 'B' for Duct Fan Type Application.
- Use 'A<sub>1</sub>' & 'B<sub>1</sub>' for Double Orifice Type Application (Ring Fan).
- Bushing Bolts go through Hub and Backing Plate and are double-nutted on back side.
- Standard cast aluminum hub shown. Fabricated steel hubs provided on series 90U, 60" and 72". Hub diameter is "D" plus 1/2. Does not affect "A" or "A<sub>1</sub>" dimension.

- ① Blade
- ② Hub
- ③ Bushing
- ④ Blade Clamp "U" Bolt
- ⑤ Shank Cap
- ⑥ (3) SAE Grade 5 Bolts Hardened w/Class 2A Thread
- ⑦ Backing Plate
- ⑧ Heavy Hex Nut w/Class 2A Thread (2 on Each Bolt)

*Hartzell*

**SERIES 90R**