

Fiberglass In-Line Centrifugal Fans

Series 40



HARTZELL®

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

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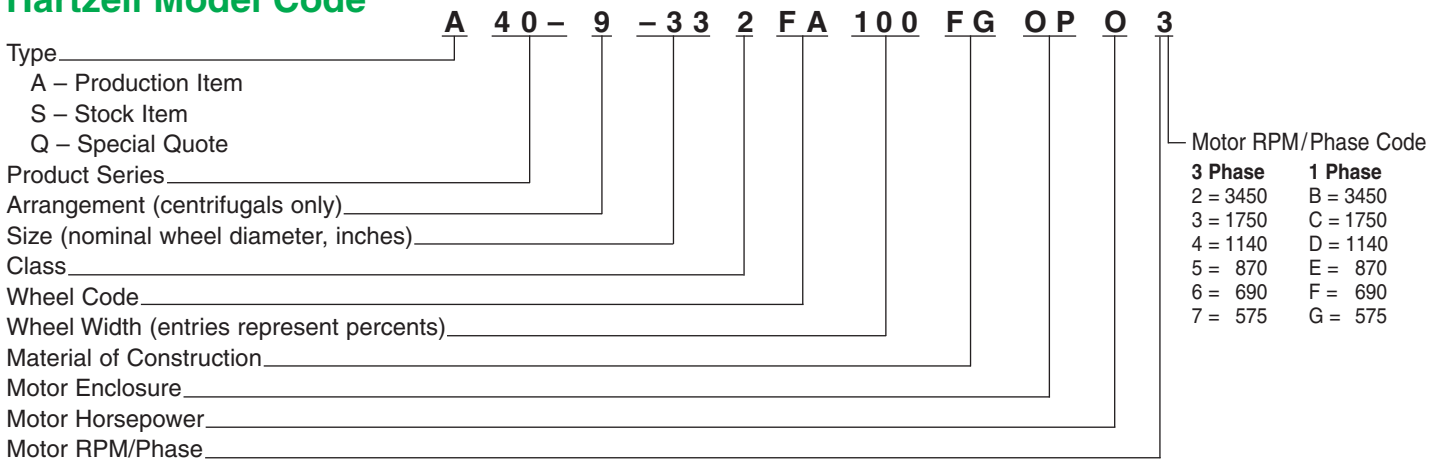
Ratings for Air and Sound Performance

Hartzell Fan, Inc. certifies that the Series 40, Fiberglass In-line Centrifugal Fans, shown herein are licensed to bear the AMCA Seal for Air and Sound Performance. The ratings shown are based on tests and procedures performed in accordance with AMCA Publication 211 and AMCA Publication 311 and comply with the requirements of the AMCA Certified Ratings Program.

Sound Performance data is available upon request. Please contact the factory and ask for Engineering Publication #SD-131.

Hartzell Model Code Explanation

Hartzell Model Code



Motor Horsepower

Horsepower	1/4	1/3	1/2	3/4	1	1 1/2	2	3	5	7 1/2	10	15	20	25	30	40	50	60	75	100
Code Letter	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W

Example:

Assume a needed performance of 13,500 CFM at 4" SP, standard air. Reading the 33" rating table on page 12, we find a fan RPM of 1,158 and brake horsepower (BHP) of 13.5. Required motor horsepower is 15. The model code can be constructed as follows: Type will be a production item (code A), product series for the Fiberglass In Line Centrifugal Fan is 40, arrangement is 9 (code 9), size of the wheel is 33", class of construction is II (code

2), wheel code for this item is FA, wheel width is 100% (code 100), material of construction is fiberglass (code FG), motor enclosure is open protected drip proof (code OP), motor horsepower is 15 (code O), and motor RPM/phase is 1750 (code 3).

Note: All other informational fields must be filled with hyphens/dashes (-) if they are not applicable to the fan being considered.

This bulletin lists Hartzell's line of Fiberglass In-Line Centrifugal Fans, Type FA and accessories. More than 70 Hartzell offices can provide specific performance and installation data to meet your requirements. Call your Hartzell representative for assistance. Visit our website (www.hartzellfan.com) or call toll-free (1-800-336-3267) for the name of your Hartzell representative.



General Fiberglass Construction Features

A variety of corrosion problems plague industry today. Fans and blowers made of coated steel or metals such as stainless and monel can handle some problem areas. Please refer to the corrosion resistance table on page 5 of this bulletin. Fiberglass centrifugal blowers can be used in most applications where corrosive elements exist in fume and vapor form. The resistance to corrosive elements is a major advantage, but the physical properties of fiberglass equipment offer these additional advantages:

- Fiberglass equipment is corrosion resistant.
- Fiberglass equipment weighs 50% less than comparable equipment made of carbon steel.
- Fiberglass has an extremely high strength-to-weight ratio, stronger than steel on a per-pound basis.
- Dimensional stability of fiberglass is excellent.
- Fiberglass air moving equipment will not become brittle at low temperatures and at 0°F the laminated fiberglass will be stronger than at room temperature.

Hartzell Fan, Inc. conforms to ASTM D4167-97, Standard Specification for Fiber-Reinforced Plastic Fans and Blowers, when optional surfacing veil, electrical grounding, and dynamic balancing to ASTM D4167-97 levels, are added to the fan.

The following are standard Hartzell fiberglass construction features:

- Corrosion resistant polyester resin, having a Class I flame spread rate of 25 or less is used for all housings. Vinylester resin having a Class II flame spread rate of 30 or less is used for all wheels.
- All structural parts in the airstream are fiberglass and resin. All fiberglass surfaces are protected with a minimum 10-mil thickness of chemical, flame, and ultraviolet resistant resin.
- Standard Shafts are 304 SS and are turned, ground, polished, and keyed at both ends with a fiberglass sleeve in the airstream. Shafts are sized to operate well below critical speed. 316 Stainless steel or monel shafting is available as an option at extra cost.
- Internal hardware (airstream), is Type 304 stainless steel. All internal hardware (airstream) is encapsulated. All external hardware (out of airstream) is zinc plated as standard. Where metal is subject to attack by the corrosive elements being handled, all metal parts can be resin-coated after assembly.



Series 40

- A fiberglass and neoprene shaft seal is placed where the shaft leaves the housing along with a neoprene shaft slinger between the seal and wheel on belt drive units. (Seal is not gas tight.)
- Bearings on belt drive units are heavy duty, deep row radial ball or double row spherical roller type self-aligning and shielded in cast iron housings. Long inner races insure even load distribution, providing a high radial and thrust load capacity. Bearings are relubricable for continuous service with lubrication tubes extended to the exterior of fan base as necessary.
- V-Belt Drives are oversized for long life and continuous duty as standard. Fixed pitch or variable pitch drives are available upon request. Belts are oil, heat, and static resistant type.



Type FA Wheel

Type FA Wheel Features

The Type FA wheel is unique in the fan and blower industry. It is available in diameters from 12" to 60" in both clockwise and counter-clockwise rotations. The wheel is airfoil design and solid fiberglass die formed, constructed with Ashland Derakane 510-A corrosion resistant vinylester resin. The manufactured wheel is a single piece, removed from the pattern whole. This assures each wheel is aerodynamically identical and provides reliable repeatable performance without the variability of hand made and taped components. The design is the result of a substantial investment in research, development, tooling, and manufacturing methods by Hartzell Fan, Inc.

The type FA wheel is highly efficient, with tapered inlet side and airfoil blades. It has non-overloading horsepower characteristic curve. When used in conjunction with a precision inlet cone it **efficiently moves large volumes of air at high pressures with low noise characteristics at low RPM.**

The fiberglass resin has a Class II flame spread rate of 30 or less. The wheel is electronically statically and dynamically balanced to the requirements of Fan Application Category BV-3 of AMCA/ANSI Std. 204-96 and receives an Operational Test and Inspection before shipment. Special constructions are available for abrasive environments or extremely corrosive environments.



Hartzell Selection Guide

The Hartzell Fiberglass In-Line Centrifugal Fan performances on the following pages are based on standard air conditions (sea level, 70°F, and 29.92 inches barometric pressure). **Performance data includes belt drive losses for power requirements.**

How to use Performance Tables

1. Select a model for a given air delivery and pressure by looking up the required flow vertically along the left column of the performance table and moving to the required pressure. The model is identified with each table.

2. Note the required RPM and BHP. Refer to page 2 Hartzell Model Code Explanation for additional details.

3. If non-standard temperature or altitude is involved, correct to standard air density (see Temperature/Altitude Applications).

When placing your order, be sure to specify the Hartzell Model Code. Be sure to include fan model, performance requirements, operating temperature, motor data (enclosure, voltage, mounting position, etc.), and a list of required accessory items. (See pages 14 and 15.) For selection assistance and additional data contact your local Hartzell Sales Representative for assistance.

Temperature/Altitude Applications

When a fan operates in ambient conditions, generally it is handling standard air at 70°F, 29.92" barometric pressure, weighing 0.075 lbs./cu. ft. For an application where the fan operates at other than ambient conditions (temperature, altitude, or both), correction factors must be applied to the selection of the fan. In addition, the standard construction of the fan must be modified.

Correction factors for temperatures and altitudes are provided in Table 1. When a fan operates at other than ambient conditions,

the correction factors in Table 1 will be required to correct static pressure and horsepower.

Table 2 shows the maximum safe operating speeds for each size fan wheel. At high temperatures, these maximum safe operating speeds should be derated.

Table 3 provides maximum safe speed correction factors by temperature and material construction. An example on the use of these tables appears at the bottom of this page.

Table 1 Altitude/Temperature Correction Factors

Temp.*(°F)	-50	-25	0	25	50	70	100	125	150	175	200
Factor	0.77	0.82	0.87	0.92	0.96	1.00	1.06	1.10	1.15	1.20	1.25

Alt.**(Ft.)	0	1,000	2,000	3,000	4,000	5,000	6,000	7,000	8,000	9,000	10,000
Factor	1.00	1.04	1.08	1.12	1.16	1.20	1.25	1.30	1.35	1.40	1.46

Above table has inverted values. Actual density is the reciprocal of the above values.

*At sea level. **At 70°F.

For corrections involving both temperature and altitude, correction factors should be multiplied.

Example: 150°F at 7000 ft.: Temperature factor 1.15 x altitude factor 1.30 = 1.50 combined correction factor.

Table 2 Maximum Safe Speeds @ 70°F

Fan Size	100% Width	66% Width
12	4,520	5,320
15	3,600	4,340
22	2,440	2,950
27	2,000	2,410
33	1,670	2,020
40	1,370	1,660
49	1,130	1,360
60	920	1,110
Tip Speed	14,500 FPM	17,500 FPM

Use of Correction Factors and Tables

First select size, RPM and BHP of the blower needed.

If temperature or altitude is involved, correct to standard air.

Example: Assume the required performance to be 13,500 CFM at 4.62" SP, 175°F and 2000 feet altitude.

1. Temperature factor 1.20 x altitude factor 1.08 = 1.30 combined correction factor.
2. Correct SP to standard 4.62" SP x 1.30 = 6"SP for 70°F at sea level.
3. A Series 40, size 33" class II 66% width belt drive backward curved centrifugal, selected from the rating tables (page 12) for the new condition shows 13,500 CFM at 6" SP, 1,499 RPM and 20.2 BHP.
4. Correct the horsepower and static pressure in item 3 to non-standard performance by dividing by factor: 6" SP divided by 1.30 = 4.62" SP; 20.2 BHP divided by 1.30 = 15.5 BHP.
5. Check the maximum safe speed. Maximum speed at 70°F for fan size 33" 66%, 2,020 RPM. Using the maximum safe speed factor table for fiberglass construction yields a safe speed factor of .95. The maximum safe speed is 2,020 x .95 = 1,919 RPM; thus operation at 1,499 RPM at 175°F is satisfactory.
6. Final performance of the unit at the assumed conditions: 3,500 CFM at 4.62" SP, 1,499 RPM, 15.5 BHP at 175°F and 2000 feet altitude.
7. Size motor for cold startups and use a special high altitude motor if altitude exceeds 3300 feet.

Table 3 Maximum Safe Speed Correction Factors*

Temp.(°F)	0	70	100	150	175	200
FRP	1.00	1.00	1.00	0.98	0.95	0.91

* To correct maximum safe operating speeds (Table 2) for high temperatures, multiply those speeds by correction factors from Table 3.



Corrosion Resistance Guide

Temperature values shown are for immersion or condensate contact applications. Where temperature values are shown, resin is suitable for hood and duct type applications for the full operating temperature range of the product. See product specifications for materials of construction and maximum operating temperature limits.

Environment	Hetron 693 Ashland F.	Hetron FR992 Ashland F.	510A Ashland F.	Environment	Hetron 693 Ashland F.	Hetron FR992 Ashland F.	510A Ashland F.	Environment	Hetron 693 Ashland F.	Hetron FR992 Ashland F.	510A Ashland F.
ACIDS				ALKALIES (Synthetic Veil)				SALTS (cont'd.)			
Acetic to 10%	180	200	210	Ammonium Bicarbonate to 50%	140	\$170	160	Sodium Ferricyanide	220	220	210
Acetic to 50%	90	160	180	Ammonium Carbonate	120	\$140	150	Sodium Fluoride	-	\$180	\$180
Acetic to 100%	-	NR	NR	Ammonium Hydroxide to 5%	\$90	\$180	\$180	Sodium Nitrate	220	220	210
Acrylic to 25%	-	100	100	Ammonium Hydroxide to 10%	\$90	\$170	\$150	Sodium Nitrite	-	220	NR
Benzene Sulfonic to 25%	180	210	150	Ammonium Hydroxide to 29%	NR	\$100	\$100	Sodium Silicate PH less than 1	160	210	NR
Benzene Sulfonic 25% up	90	210	NR	Barium Carbonate	180	\$240	210	Sodium Sulfate	180	240	210
Benzoic	250	220	210	Barium Hydroxide to 10%	-	\$170	150	Sodium Sulfite	-	220	210
Boric	180	220	210	Calcium Hydroxide to 15%	160	\$210	\$180	Stannic Chloride	*180	*220	*210
Butyric to 50%	150	150	210	Magnesium Carbonate	160	\$210	180	Stannous Chloride	*200	*220	*210
Butyric 50% up	-	100	80	Potassium Bicarbonate to 10%	90	\$170	\$150	Zinc Chloride	200	*220	*210
Carbonic	160	220	NR	Potassium Carbonate to 10%	90	\$180	\$150	Zinc Nitrate	180	220	210
Chloroacetic to 25%	NR	*180	*150	Potassium Hydroxide to 25%	NR	\$120	\$150	Zinc Sulfite	150	220	NR
Chloroacetic 25% to 50%	NR	*150	*120	Sodium Bicarbonate to 10%	140	\$210	\$180				
Chromic to 5%	100	110	150	Sodium Carbonate to 35%	90	\$180	\$180	SOLVENTS			
Chromic to 10% to 20%	-	NR	150	Sodium Hydroxide to 10%	NR	\$160	\$180	Acetone to 10%	NR	180	180
Citic	*200	*220	*210	Sodium Hydroxide to 25%	NR	\$160	\$180	Benzene	90	80	NR
Fluoboric	*\$90	*\$220	*\$210	Sodium Sulfide	90	\$220	\$210	Carbon Disulfide	NR	NR	NR
Gluosilicic up to 10%	\$100	\$150	\$180	Trisodium Phosphate to 50%	-	\$175	210	Carbon Tetrachloride	90 VAPOR	110	150
Formic up to 10%	200	150	180					Chlorobenzene	NR	NR	NR
Gluconic to 50%	120	180	180	SALTS				Ethyl Acetate	NR	NR	NR
Hydrobromic to 25%	*160	*170	*180	Aluminum Chloride	*120	*240	*210	Ethyl Chloride	90 VAPOR	NR	NR
Hydrochloric to 15%	*230	*210	*180	Aluminum Potassium Sulfate	160	240	210	Ethylene Dibromide	NR	NR	NR
Hydrocyanic to 10%	200	170	210	Aluminum Sulfate	250	240	210	Ethylene Glycol	250	220	210
Hydrofluoric to 10%	***\$100	***\$150	***\$150	Ammonium Chloride	*200	*220	*210	n-Heptane	120	210	210
Hydrofluorosilicic up to 10%	*\$100	*\$150	*\$180	Ammonium Nitrate	200	220	220	Hexane	-	150	160
Hypochlorous to 20%	90	110	NR	Ammonium Persulfate	150	200	180	Methyl Ethyl Ketone to 10%	NR	80	NR
Lactic	*200	*220	*210	Ammonium Persulfate, saturate	150	NR	NR	Naphtha	200	210	180
Maleic	170	210	210	Ammonium Sulfate	200	220	220	Naphthalene	130	220	210
Nitric to 5%	200	170	150	Aniline Sulfate to 25%	150	220	210	Tetrachloroethylene	NR	100	80
Nitric 5% to 20%	-	140	120	Aniline Sulfate, saturated	150	220	NR	Toluene	90	NR	80
Oleic	200	220	210	Barium Chloride	200	240	210	Xylene	90	80	80
Oxalic	*220	*220	*210	Barium Sulfide	NR	\$210	180				
Perchloric to 10%	H&D	**150	**150	Calcium Chlorate	180	220	220	BLEACHES			
Phosphoric	*220	*\$210	*\$210	Calcium Chloride	250	240	220	Calcium Chlorate	180	220	220
Phosphoric, super	-	*\$210	*\$210	Calcium Sulfate	*200	*240	*210	Calcium Hypochlorite	100	NR	\$160
Phthalic Anhydride	*150	*210	*210	Copper Chloride	*250	*220	*210	Chlorine Dioxide up to 15%	-	160	*200
Picric to 10%	100	170	NR	Copper Cyanide	90	\$220	210	Chlorine Water	*125	*210	*200
Silicic	-	220	NR	Copper Fluoride	NR	\$170	NR	Hydrogen Peroxide to 30%	120	100	150
Stearic	200	220	210	Copper Sulfate	250	240	210	Sodium Chlorate	90	210	210
Sulfamic to 25%	160	150	NR	Ferric Chloride	*250	*220	*210	Sodium Hypochlorite to 15%	NR	125	\$180
Sulfuric to 25%	*200	*220	*210	Ferric Nitrate	170	220	210				
Sulfuric to 50%	*200	*200	*180	Ferric Sulfate	200	220	210	OTHERS			
Sulfuric to 70%	*150	*180	*100	Ferrous Chloride	*220	*220	*210	Alum. Chlorohydroxide to 50%	-	220	210
Sulfuric to 80%	NR	80	NR	Ferrous Nitrate	160	220	210	Ammonium Phosphate	150	210	210
Sulfurous to 10%	90	110	120	Ferrous Sulfate	220	220	210	Aqua Rega	NR	*80	NR
Tannic	200	220	210	Lead Acetate	160	220	210	Detergents	120	170	150
Tartaric	220	220	210	Magnesium Chloride	220	240	210	Glycerine	200	220	210
Trichloroacetic to 50%	*90	*220	*200	Magnesium Hydroxide	-	\$210	210	Kerosene	120	210	180
				Magnesium Sulfate	200	210	210	Photographic Solutions	-	80	NR
ALCOHOLS				Mercuric Chloride	*210	*220	*210	Perchloroethylene	NR	100	80
Amyl	200	210	120	Mercurous Chloride	210	220	210	Sodium Tetraborate	180	\$210	180
Benzyl	NR	100	NR	Nickel Chloride	220	220	210	Sodium Tripolyphosphate	125	210	210
Butyl	190	150	120	Nickel Nitrate	220	220	210	Sodium Xylene Sulfonate	-	170	160
Ethyl	90	120	80	Nickel Sulfate	220	220	210	Sorbitol Solutions	180	220	160
Methyl	90	80	NR	Potassium Chloride	200	240	210	Urea	90	170	150
				Potassium Dichromate	200	220	210	Urea-Ammonium-Nitrate	-	120	120
GASES AND VAPORS				Potassium Ferricyanide	200	220	210	Fertilizer Fumes	100	120	150
Ammonia, Dry	90	170	100	Potassium Nitrate	200	220	210	Shell-D-D	NR	100	NR
Ammonia, Wet	90	NR	NR	Potassium Permanganate	150	210	210	Steam Vapor	180	210	180
Bromine, Wet	90	*100	NR	Potassium Persulfate	90	220	210				
Carbon Dioxide	250	250	250	Potassium Sulfate	200	240	210				
Carbon Monoxide	200	250	250	Silver Nitrate	200	220	210				
Chlorine, Dry	*200	*210	NR	Sodium Acetate	150	220	210				
Fluorine	-	NR	80	Sodium Bisulfate	200	220	210				
Hydrogen Fluoride, Vapor	*90	*\$180	*\$180	Sodium Chloride	200	240	180				
Hydrogen Sulfide to 5%	250	240	180	Sodium Chlorite to 10%	175	170	150				
Sulfur Dioxide, Dry	200	250	210	Sodium Cyanide	100	220	210				
Sulfur Dioxide, Wet	200	250	210	Sodium Dichromate	160	220	210				
Sulfur Trioxide, Wet	-	220	210								

Reference
C.R.G.13

NOTES: NR = Not Recommended S = Synthetic surfacing veil or mat required. Contact factory. "-" = No test data available

* Special shaft and hardware required, contact factory.

** Special design considerations required (explosive environment), contact factory.

*** Do not use HartKoate. Special shaft and hardware required, contact factory.

For environments not shown, or when temperatures exceed the maximum listed, contact factory.

Hydrocarbon fuel environments may require static grounding, contact factory.



Do not use HartKoate (Alum. Oxide) with Hydrofluoric acid.



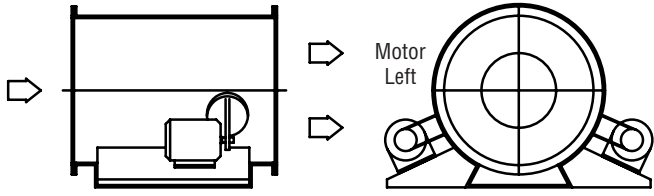
Hartzell In-Line Centrifugal Fan Classifications

Hartzell Series 40 Fiberglass Backward Curved Centrifugal Fans, Type FA, are designed and classified With two classes of construction. Class 1 construction covers light to medium duty performance. Class 2 construction is required for maximum fan performance, but is inappropriate under light duty applications due to inadequate loading of the bearings.

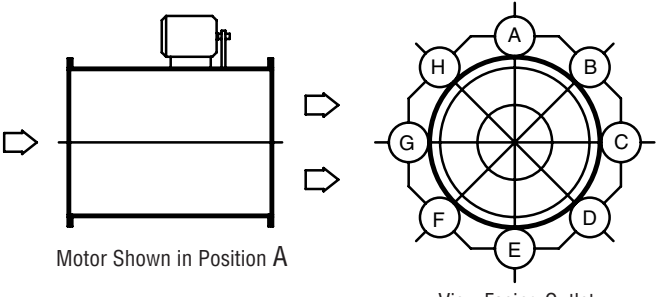
Hartzell Series 40 Fiberglass In-line Centrifugal Fans, Type FA are available in Class I and II construction in 100% width and 66% width. These parameters are explained in the following table.

FAN CLASS	PERFORMANCE RANGE	TABLE SHADING
I	Light to Medium Duty	
II	Maximum Fan Performance	

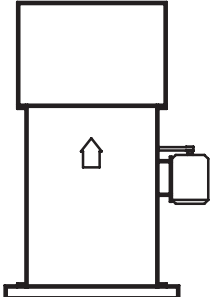
In-Line Centrifugal Fan Arrangements



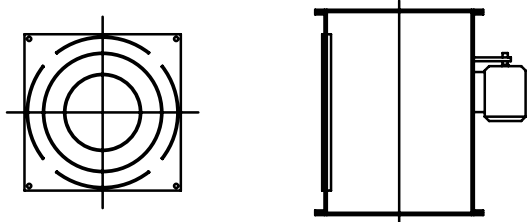
Arrangement 1
For belt drive. Impeller overhung on a shaft supported by bearing mounted with casing. Motor mounted independent of casing. Horizontal discharge.



Arrangement 9
For belt drive. Impeller overhung on a shaft supported by bearings mounted with casing. Fan may be rotated to achieve motor positions. For horizontal and vertical discharge. Duct mounting shown. Arrangement 9 can be furnished with supports for floor, wall or ceiling mounting. The position of these supports determines which motor locations are available for motor placement. Generally motor locations D, E and F are not available on floor, wall or inverted ceiling mounted fans and motor locations B, C, G & H may not be available for ceiling hung fans.



Arrangement 9 – PRV
When desirable, the in-line centrifugal fan can be mounted as a power roof ventilator for exhaust application. Together with a stack cap and panel, the three elements combine to provide an efficient roof exhauster. Back draft dampers in the stack cap offer weatherproof closure for vertical air discharge.



Vertical Mounting
Another method for mounting vertical fans is shown in the view above. Specify fan to be furnished with ceiling mounting brackets, floor mounting brackets or both. Specify either upblast or downblast discharge for vertically mounted fans.



Series 40 Fiberglass In-line Centrifugal Fan

Series 40 Hartzell In-Line Centrifugal Fan offers non-overloading, high efficiency, low noise, and economy for corrosive atmospheres. This fan is unique in the fan and blower industry. It combines the design advantages of the axial flow fan with the performance characteristics of the centrifugal fan. The “tubular centrifugal,” or in-line fan, offers straight airflow for duct installations with the proven, highly efficient, backward curved airfoil-bladed wheel in a vane-equipped housing. This design saves space as compared to the traditional scroll-type centrifugal housing by incorporating a tubular housing. The design allows the unit to be installed directly in a duct system with the same inlet and discharge dimensions. The inline design incorporates guide vanes and airfoil centrifugal wheel to produce a compact, highly efficient unit with low noise characteristics.

- **Applications** – Developed for compatible corrosive applications where it is advantageous to have fiberglass materials and have the motor out of the airstream with the versatility of a belt drive fan. (Refer to Corrosion Resistance Guide on page 5.)
- **Performance** – Type FA fiberglass airfoil wheel with inlet cone and housing built in aerodynamically designed straightening vanes produces from 800 CFM to 90,000 CFM at pressures from free delivery to 12" W.G. at high efficiencies with non-overloading horsepower, low noise, and low RPM. Power Ratings (BHP) includes Belt Drive Losses. Maximum temperature capability is 200°F.



Series 40

Features

- **Sizes** – 12", 15", 22", 27", 33", 40", 49", and 60" wheel diameters. Available in Class I and II in both 100% width and 66% width. Available in Arrangements #9 and #1. Also available in Power Roof Ventilator configuration.
- **FRP Materials** – Solid fiberglass wheel molded with Ashland Derakane 510-A corrosion resistant vinyl ester resin having a Class II flame spread rate of 30 or less. The housing and other standard FRP components are constructed of fiberglass and Ashland 693 corrosion resistant polyester resin having a Class I flame spread rate of 25 or less. No metal parts are exposed in the airstream. See Corrosion Resistance Guide on page 5 for resin characteristics. Other resins are available.
- **Type FA Wheel – High efficiency, airfoil design with one-piece, solid fiberglass**, construction. Tapered inlet side design efficiently moves large volumes of air at high pressures. Wheel has non-overloading horsepower characteristic curve.
- **Shafts** – Shafts are 304 SS and are turned ground and polished, keyed at both ends with fiberglass sleeve in the airstream and sized to operate well below critical speed.
- **Bearings** – Bearings are heavy duty ball or roller type, in cast iron housings, selected for minimum L-50 Life of 500,000 hours for horizontal fans; and 250,000 for vertical fans, and include extended lubrication fittings as standard.
- **Standard Shaft Seal** – A fiberglass and neoprene shaft seal is placed where the shaft leaves the housing along with a neoprene shaft slinger between the seal and wheel. Seal is not gas tight.
- **Hardware** – Airstream hardware is encapsulated Type 304 stainless steel.
- **Motor Out of the Airstream** – Exterior mounting on fully adjustable platform style motor base supported by external housing assembly base. Open-end motors are standard. Motors larger than 30 HP will be shipped separately for mounting on unit at job site. Motor frame size limits are identified in Dimensions table on page 8.
- **Drives** – V-Belt Drives are oversized for long life and continuous duty. Variable pitch drives are standard option for 10 HP and below and fixed pitch as standard option above 10 HP. Belts are oil, heat, and static resistant type.
- **Balancing** – The fan is electronically statically and dynamically balanced to the requirements of Fan Application Category BV-3 of AMCA/ANSI Std. 204-96. All fans receive vibration test and inspection prior to shipment.
- **Options and Accessories** – See pages 14 and 15.
- **Spark Resistant Construction** – Spark Resistant construction for fiberglass equipment is an available option, see page 15.
- **Protective Coatings** – For abrasive environments or extremely corrosive environments special construction is available, see page 15.

Hartzell Fan, Inc. certifies that the Series 40, Fiberglass In-line Centrifugal Fans, shown herein are licensed to bear the AMCA Seal for Air and Sound Performance. The ratings shown are based on tests and procedures performed in accordance with AMCA Publication 211 and AMCA Publication 311 and comply with the requirements of the AMCA Certified Ratings Program.

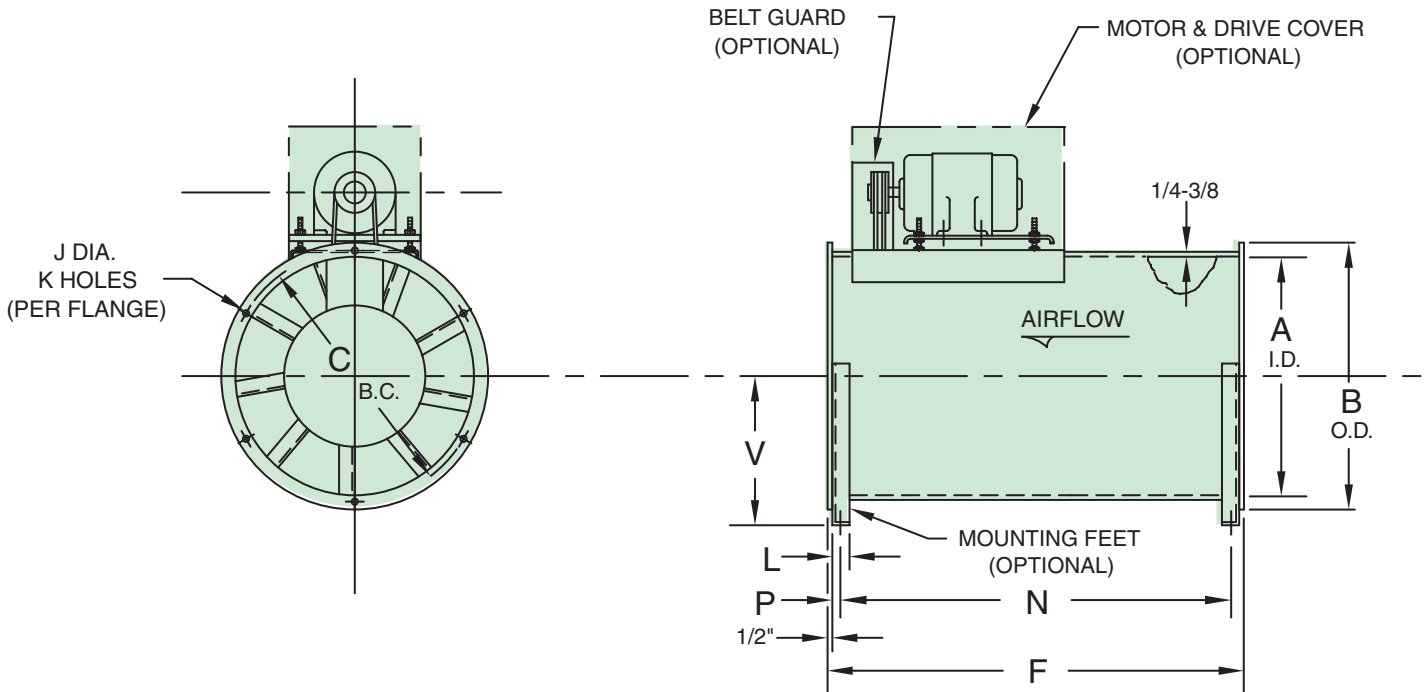
Sound Performance data is available upon request. Please contact the factory and ask for Engineering Publication #SD-131.



Type FA Wheel



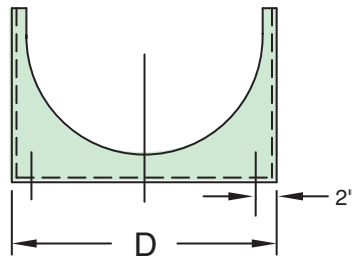
Dimensions – Arrangement 9



Size	A	B	C	F	J	K	L	N	P	Max Motor Frame
12	18 ⁷ / ₈	22 ¹ / ₈	20 ¹ / ₂	25	7 ⁷ / ₁₆	6	1 ¹ / ₂	22 ¹ / ₂	3 ³ / ₄	213T
15	20 ⁷ / ₈	24 ¹ / ₈	22 ¹ / ₂	35 ³ / ₄	7 ⁷ / ₁₆	6	1 ¹ / ₂	33 ¹ / ₄	3 ³ / ₄	215T
22	33	36 ¹ / ₂	34 ⁷ / ₈	44 ³ / ₈	7 ⁷ / ₁₆	6	1 ¹ / ₂	41 ⁷ / ₈	3 ³ / ₄	256T
27	41	44 ¹ / ₈	42 ⁷ / ₈	48	7 ⁷ / ₁₆	6	1 ¹ / ₂	45 ¹ / ₂	3 ³ / ₄	286T
33	45	49 ¹ / ₈	47 ¹ / ₈	57	7 ⁷ / ₁₆	12	1 ¹ / ₂	54 ¹ / ₂	3 ³ / ₄	326T
40	54 ⁷ / ₈	59 ⁵ / ₈	57 ⁵ / ₈	64	7 ⁷ / ₁₆	12	2 ¹ / ₂	60 ¹ / ₂	1 ¹ / ₄	365T
49	66 ⁷ / ₈	72 ¹ / ₂	70 ¹ / ₄	85 ¹ / ₂	7 ⁷ / ₁₆	12	2 ¹ / ₂	82	1 ¹ / ₄	405T
60	81 ⁷ / ₈	88	85 ³ / ₄	103 ⁵ / ₈	7 ⁷ / ₁₆	12	2 ¹ / ₂	100 ¹ / ₈	1 ¹ / ₄	405T

Size	D	V
12	22 ¹ / ₂	12 ⁵ / ₈
15	24 ¹ / ₂	14
22	36 ⁵ / ₈	20 ¹ / ₈
27	44 ³ / ₄	24 ¹ / ₈
33	48 ³ / ₄	26 ¹ / ₈
40	60 ¹ / ₈	31 ⁷ / ₈
49	75	37 ¹ / ₂
60	90 ¹ / ₂	47 ¹ / ₁₆

Dimensions and specifications are subject to change. Certified prints are available.



MOUNTING FEET (STEEL)
(OPTIONAL)



Material Specifications/Weight

Class	Fan Size	Fan Shaft	Drive Bearing	Wheel Bearing	100% Inertia	66% Inertia	Installation Weight	
							100%	66%
I	12	1 ³ / ₁₆	P3-U219	P3-U219	1.6	1.4	93	93
	15	1 ³ / ₁₆	F3-U219	F3-U219	4.7	4.2	146	144
	22	2 ³ / ₁₆	F3-U235	F3-U235	29	25.1	312	307
	27	1 ¹⁵ / ₁₆	F3-U231	F3-U231	78.2	67.8	537	526
	33	2 ³ / ₁₆	F3-U235	F3-U235	160	140	672	657
	40	2 ¹¹ / ₁₆	F3-U243	F3-U243	423	368	962	935
	49	2 ¹⁵ / ₁₆	F3-U247	F3-U247	1181	1033	1594	1545
II	60	3 ³ / ₁₆	F-B22451	F-B22451	2877	2472	2399	2308
	12	1 ³ / ₁₆	PE-B22419	P3-U219	1.6	1.4	96	96
	15	1 ¹¹ / ₁₆	F3-U227	F3-U227	4.7	4.2	159	157
	22	1 ¹¹ / ₁₆	F-B22427	F-B22427	29	25.1	302	297
	27	1 ¹⁵ / ₁₆	F-B22431	F-B22431	78.2	67.8	543	532
	33	2 ³ / ₁₆	F-B22435	F-B22435	160	140	683	668
	40	2 ¹¹ / ₁₆	F-B22443	F-B22443	423	368	990	963
	49	2 ¹⁵ / ₁₆	F-B22447	F-B22447	1181	1033	1611	1563
60	3 ¹¹ / ₁₆	F-B22459	F-B22459	2877	2472	2507	2416	

Dimensions and specifications are subject to change. Certified prints are available. Installation weight is approximate and is less motor, drives, and optional equipment.

Other Fiberglass Hartzell Fans

Hartzell Fan pioneered the development of fiberglass reinforced fans and blowers and manufactures the most complete line available to industry. Fiberglass construction is recommended where corrosive elements exist in fume and vapor form. Hartzell Fan offers a complete selection of axial fans in steel, aluminum stainless steel and fiberglass materials to fit your ventilation requirements. More than 70 Hartzell offices can provide specific performance and installation data to meet your requirements. Call your Hartzell representative for assistance. Visit our website (www.hartzellfan.com) or call toll-free (1-800-336-3267) for the name of your Hartzell representative.



Fiberglass Wall Ventilators – Series 59
Direct drive wall ventilator designed for general ventilation where corrosive elements exist in fume or vapor form. Temperatures to 180° with specially insulated motors. Unit constructed of solid fiberglass. Sizes 12" to 60". Performance from 1,315 to 55,500 CFM at free air. Request Bulletin A-137.



Fiberglass Upblast Roof Ventilator – Belt Drive – Series 37
Meets the need for a heavy duty, belt drive, upblast ventilator with motor out of the airstream. Ideal for applications where severe corrosive elements are present. Available in sizes 12" to 60". Performance ranging from 1260 CFM to 61,765 CFM at free air. See Bulletin A-141 for details.



Fiberglass Hooded Roof Ventilator – Belt Drive – Series 58
Hooded ventilators design provides complete protection from the elements for exhaust operation. Unit's belt drive configuration and exterior motor mounting makes this the logical choice where corrosive elements exist and protection from the weather is essential. Sizes 12" to 60", with CFM from 1280 to 63,470 at free air. See Bulletin A-141 for details.



Fiberglass Duct Axial Fans - Belt Drive – Series 35
Designed for maximum efficiency in the static pressure range of 1" to 3" at low speeds and low noise. Internal hardware of stainless steel. Sizes 12" to 60". Belt drive units have open end protected motors as standard. CFM from 470 to 70,000 at 1" S.P. Direct drive units have totally enclosed chemical plant motors as standard. CFM from 1204 to 68,950 at free air. See Bulletin A-139 for details.



Fiberglass By-Pass Fan – Direct Drive – Series 28B and 29B
Engineered and built to be used in a variety of corrosive applications. Direct drive motor out of the airstream. Suitable for temperatures to 200°F with specially insulated motors. 28B has Type FW low pressure propeller; 29B has Type E, medium pressure propeller. Sizes 24" to 48", with performance ranging from 6012 CFM to 46,145 CFM at free air. See Bulletin A-139 for details.



Fiberglass Backward Curved Centrifugal Blowers, Belt Drive –SWSI – Series 41
Airfoil, one-piece solid fiberglass wheel has non-overloading horsepower characteristics. The wheel and housing constructed with special corrosive-resistant polyester resin plus flame retardant additives. Internal hardware is stainless steel. No metal parts are exposed in the airstream. Sizes 12" to 60" wheel diameters. Static pressures up to 20" W. G. Performance from 700 to 75,000 CFM at 5" S.P. Request Bulletin A-160.



Fiberglass Radial Blowers, Direct or Belt Drive – SWSI – Series 42
Suited for lab hood installation at static pressures from 0" to 8". Clockwise rotation. Rotatable in field. Packaged unit completely assembled. Internal hardware is of stainless steel encapsulated with fiberglass. Sizes 10", 12" and 14" wheel diameters. Performance from 100 to 2000 CFM at 2" S.P. Request Bulletin A-140.

Fiberglass Air Control Products



Fiberglass Fixed Blade Louver – for air intake or relief applications. Request A-138.
Fiberglass End-Pivoted Shutter (Shown) – Recommended for gravity back-draft prevention applications. Request A-138.
Fiberglass Center-Pivoted Low Velocity Damper – Recommended for back-draft prevention applications. Manually or motor operated. Request A-138.
Fiberglass Center-Pivoted High Velocity Damper – for volume control and back flow prevention in medium to high pressure applications. Parallel or opposed blade. Request A-138.



Performance Data

Class I Class II

A40-_-12_FA100FG

Wheel Diameter: 12.25 in.
Outlet Area: 1.943 sq. ft.

CFM	Outlet Velocity FPM	Static Pressure															
		1"		2"		3"		4"		5"		6"		7"		8"	
		RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
800	412	1631	0.22	2145	0.46	2585	0.75	2972	1.07	3310	1.42	3605	1.77	3875	2.14	4127	2.52
1000	515	1757	0.29	2235	0.56	2634	0.86	2996	1.20	3334	1.58	3642	1.99	3926	2.41	4184	2.85
1200	618	1913	0.36	2346	0.67	2724	1.00	3060	1.36	3368	1.75	3665	2.17	3946	2.63	4210	3.12
1400	721	2088	0.46	2474	0.80	2833	1.17	3153	1.55	3447	1.96	3720	2.40	3980	2.86	4235	3.37
1600	823	2275	0.58	2626	0.95	2953	1.35	3262	1.78	3543	2.22	3806	2.68	4054	3.16	4289	3.67
1800	926	2472	0.72	2794	1.13	3092	1.56	3380	2.02	3653	2.50	3906	3.00	4145	3.50	4373	4.03
2000	1029	2675	0.89	2972	1.33	3249	1.80	3513	2.29	3771	2.81	4018	3.34	4250	3.88	4470	4.44
2200	1132	2884	1.10	3158	1.56	3418	2.06	3664	2.59	3903	3.13	4137	3.70	4363	4.29		
2400	1235	3098	1.34	3351	1.83	3595	2.36	3827	2.92	4050	3.50	4268	4.10	4483	4.72		
2600	1338	3314	1.61	3550	2.13	3779	2.70	3999	3.29	4210	3.90	4414	4.53				
2800	1441	3534	1.93	3754	2.48	3969	3.07	4177	3.70	4378	4.34						
3000	1544	3755	2.29	3962	2.87	4164	3.49	4361	4.15								

A40-_-12_FA-66FG

Wheel Diameter: 12.25 in.
Outlet Area: 1.943 sq. ft.

CFM	Outlet Velocity FPM	Static Pressure															
		1"		2"		3"		4"		6"		8"		10"		12"	
		RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
800	412	1811	0.24	2276	0.46	2662	0.71	3002	0.98								
1000	515	2006	0.32	2443	0.58	2804	0.87	3124	1.17	3688	1.83	4189	2.58				
1200	618	2221	0.41	2625	0.72	2970	1.04	3273	1.38	3810	2.11	4284	2.90	4715	3.76	5123	4.69
1400	721	2458	0.54	2822	0.88	3149	1.24	3442	1.61	3954	2.43	4409	3.27	4824	4.18	5207	5.14
1600	823	2706	0.69	3034	1.07	3341	1.47	3621	1.88	4116	2.76	4553	3.70	4953	4.67	5325	5.68
1800	926	2963	0.88	3260	1.29	3544	1.73	3811	2.18	4291	3.13	4713	4.14	5099	5.20		
2000	1029	3225	1.11	3500	1.55	3760	2.02	4011	2.52	4473	3.54	4885	4.62	5259	5.75		
2200	1132	3491	1.38	3748	1.86	3987	2.36	4222	2.89	4663	4.00	5064	5.14	5430	6.34		
2400	1235	3759	1.70	4002	2.21	4226	2.75	4443	3.31	4862	4.50	5249	5.72				
2600	1338	4030	2.07	4261	2.62	4472	3.19	4674	3.78	5070	5.04	5443	6.35				
2800	1441	4303	2.50	4523	3.08	4724	3.68	4915	4.31	5286	5.64						
3000	1544	4579	2.98	4788	3.60	4980	4.24	5161	4.90								

A40-_-15_FA100FG

Wheel Diameter: 15.375 in.
Outlet Area: 2.377 sq. ft.

CFM	Outlet Velocity FPM	Static Pressure															
		1"		2"		3"		4"		5"		6"		7"		8"	
		RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
800	337	1203	0.25	1643	0.57	1990	0.94										
1200	505	1313	0.37	1715	0.75	2050	1.19	2335	1.67	2589	2.19	2822	2.74	3038	3.31		
1600	673	1471	0.52	1824	0.97	2129	1.47	2407	2.02	2656	2.61	2882	3.24	3090	3.90	3286	4.58
2000	841	1664	0.75	1969	1.25	2248	1.83	2499	2.43	2734	3.07	2955	3.77	3163	4.49	3356	5.25
2400	1010	1880	1.05	2143	1.61	2392	2.24	2626	2.93	2843	3.64	3047	4.37	3242	5.15	3431	5.97
2800	1178	2109	1.44	2338	2.08	2560	2.75	2774	3.50	2978	4.30	3169	5.11	3351	5.94	3526	6.80
3200	1346	2345	1.94	2551	2.65	2749	3.39	2942	4.17	3129	5.02	3310	5.92	3483	6.85		
3600	1515	2586	2.56	2775	3.35	2952	4.16	3128	5.00	3299	5.88	3466	6.82				
4000	1683	2831	3.31	3006	4.17	3169	5.07	3328	5.98	3485	6.92						
4400	1851	3078	4.21	3242	5.15	3393	6.12	3539	7.11								
4800	2019	3328	5.27	3481	6.29												
5200	2188	3580	6.51														

A40-_-15_FA-66FG

Wheel Diameter: 15.375 in.
Outlet Area: 2.377 sq. ft.

CFM	Outlet Velocity FPM	Static Pressure															
		2"		4"		6"		8"		9"		10"		11"		12"	
		RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
900	379	1738	0.64	2382	1.49	2892	2.49	3328	3.63								
1200	505	1824	0.80	2441	1.75	2934	2.86	3359	4.09	3553	4.75	3738	5.43	3914	6.14	4083	6.88
1500	631	1933	0.98	2519	2.05	2996	3.26	3409	4.60	3599	5.31	3779	6.04	3952	6.80	4118	7.58
1800	757	2065	1.21	2614	2.38	3074	3.71	3476	5.15	3661	5.92	3837	6.70	4006	7.51	4168	8.35
2100	883	2225	1.50	2725	2.75	3166	4.19	3556	5.76	3736	6.57	3908	7.42	4073	8.28	4232	9.17
2400	1010	2407	1.88	2852	3.17	3271	4.72	3648	6.40	3823	7.28	3991	8.18	4152	9.10	4307	10.0
2700	1136	2599	2.33	2999	3.69	3389	5.31	3751	7.09	3920	8.03	4084	8.99	4241	9.98		
3000	1262	2799	2.86	3165	4.31	3521	5.97	3866	7.85	4029	8.84	4187	9.86	4339	10.9		
3300	1388	3005	3.48	3345	5.06	3669	6.75	3991	8.69	4148	9.73	4301	10.8				
3600	1515	3216	4.20	3534	5.92	3833	7.67	4131	9.64	4278	10.7						
3900	1641	3429	5.02	3729	6.87	4010	8.75	4284	10.7								
4200	1767	3646	5.96	3930	7.94	4195	9.96										

Performance certified for installation Type B: free inlet/ducted outlet. Power rating (BHP) includes transmission losses. Performance data is based on standard air conditions (0.075 #/ft.3). Performance ratings do not include the effects of appurtenances (accessories). MOST EFFICIENT FAN SELECTION APPEARS IN BOLD PRINT. To complete model code, add arrangement, class of construction, motor enclosure code, motor horsepower code and motor speed code. Refer to page 2 for more information.



Performance Data

Class I Class II

A40- -22_FA100FG

Wheel Diameter: 22.625 in.
Outlet Area: 5.94 sq. ft.

CFM	Outlet Velocity FPM	Static Pressure															
		1"		2"		3"		4"		5"		6"		7"		8"	
		RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
3200	539	872	0.79	1124	1.59												
4000	673	963	1.04	1186	1.97	1383	2.98	1557	4.05								
4800	808	1072	1.37	1261	2.38	1444	3.54	1609	4.75	1760	6.01	1902	7.32				
5600	943	1191	1.80	1355	2.90	1517	4.15	1673	5.51	1816	6.91	1952	8.35	2078	9.83	2199	11.4
6400	1077	1315	2.32	1461	3.54	1603	4.85	1745	6.32	1882	7.88	2011	9.46	2133	11.1	2249	12.7
7200	1212	1443	2.96	1576	4.29	1703	5.71	1829	7.23	1955	8.89	2078	10.6	2195	12.4	2307	14.2
8000	1347	1574	3.73	1696	5.18	1812	6.71	1926	8.31	2039	10.0	2153	11.9	2265	13.8	2372	15.8
8800	1481	1707	4.64	1820	6.21	1927	7.86	2032	9.57	2135	11.4	2238	13.2	2341	15.3	2444	17.4
9600	1616	1842	5.71	1947	7.40	2047	9.17	2144	11.0	2239	12.9	2334	14.8	2428	16.9		
10400	1751	1978	6.95	2077	8.77	2170	10.6	2261	12.6	2350	14.6	2437	16.7				
11200	1886	2115	8.38	2208	10.3	2296	12.3	2381	14.4								
12000	2020	2253	10.0	2340	12.1	2424	14.2										

A40- -22_FA-66FG

Wheel Diameter: 22.625 in.
Outlet Area: 5.94 sq. ft.

CFM	Outlet Velocity FPM	Static Pressure															
		2"		4"		6"		8"		9"		10"		11"		12"	
		RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
2500	421	1162	1.30	1554	2.81												
3300	556	1261	1.72	1618	3.45	1915	5.41										
4100	690	1367	2.11	1711	4.24	1988	6.42	2233	8.79	2350	10.0	2464	11.4	2575	12.7		
4900	825	1481	2.60	1814	5.10	2081	7.60	2313	10.2	2421	11.6	2526	12.9	2627	14.4	2725	15.9
5700	960	1606	3.23	1920	5.88	2182	8.90	2408	11.8	2513	13.3	2612	14.8	2708	16.3	2801	17.9
6500	1094	1744	3.99	2033	6.76	2287	10.1	2509	13.5	2611	15.2	2708	16.8	2801	18.5	2892	20.2
7300	1229	1891	4.92	2151	7.89	2396	11.3	2614	15.1	2714	17.1	2810	19.0	2901	20.8		
8100	1364	2046	6.02	2278	9.21	2509	12.7	2721	16.7	2820	18.8	2914	21.0				
8900	1498	2205	7.32	2415	10.7	2628	14.4	2833	18.4	2929	20.7						
9700	1633	2368	8.86	2559	12.4	2754	16.3	2948	20.5								
10500	1768	2534	10.6	2708	14.4	2888	18.5										
11300	1902	2702	12.7	2863	16.6												

A40- -27_FA100FG

Wheel Diameter: 27.625 in.
Outlet Area: 7.467 sq. ft.

CFM	Outlet Velocity FPM	Static Pressure															
		1"		2"		3"		4"		5"		6"		7"		8"	
		RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
4800	524	696	1.19	896	2.34												
6000	654	763	1.57	945	2.92	1101	4.38										
7200	785	842	2.04	1006	3.61	1150	5.25	1279	6.98	1407	8.88						
8400	916	930	2.63	1074	4.37	1211	6.26	1332	8.18	1444	10.2	1554	12.3	1662	14.5		
9600	1047	1023	3.35	1151	5.27	1275	7.35	1393	9.52	1499	11.7	1599	14.0	1695	16.3	1791	18.8
10800	1178	1120	4.23	1235	6.33	1348	8.58	1457	11.0	1561	13.4	1657	15.9	1747	18.4	1834	20.9
12000	1309	1218	5.28	1324	7.56	1427	9.99	1527	12.5	1624	15.2	1718	17.9	1807	20.7	1889	23.4
13200	1440	1318	6.52	1417	8.99	1511	11.6	1603	14.3	1694	17.1	1782	20.1	1868	23.1	1951	26.1
14400	1571	1419	7.95	1513	10.6	1599	13.4	1685	16.3	1769	19.3	1852	22.4	1933	25.6		
15600	1702	1521	9.60	1610	12.5	1692	15.5	1770	18.5	1849	21.7	1927	25.0	2003	28.4		
16800	1832	1623	11.5	1709	14.6	1786	17.8	1860	21.0	1933	24.4						
18000	1963	1726	13.7	1808	17.0	1882	20.3	1952	23.8								

A40- -27_FA-66FG

Wheel Diameter: 27.625 in.
Outlet Area: 7.467 sq. ft.

CFM	Outlet Velocity FPM	Static Pressure															
		2"		4"		6"		8"		9"		10"		11"		12"	
		RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
5000	545	1009	2.58	1303	5.25												
6000	654	1086	3.20	1357	6.18	1590	9.48										
7000	764	1170	3.93	1422	7.22	1642	10.9	1839	14.7	1933	16.7						
8000	873	1258	4.77	1498	8.41	1703	12.3	1891	16.6	1979	18.7	2064	20.9	2148	23.2	2229	25.6
9000	982	1351	5.76	1579	9.77	1773	14.0	1951	18.5	2035	20.8	2117	23.3	2196	25.7	2273	28.2
10000	1091	1449	6.94	1663	11.3	1850	15.8	2019	20.6	2099	23.1	2177	25.7	2253	28.3	2327	31.0
11000	1200	1551	8.30	1751	12.9	1932	17.9	2093	23.0	2170	25.6	2244	28.3	2317	31.1		
12000	1309	1655	9.85	1842	14.8	2016	20.1	2173	25.6	2246	28.4	2318	31.2				
13000	1418	1760	11.6	1937	16.9	2102	22.5	2256	28.4	2327	31.4						
14000	1527	1868	13.6	2035	19.3	2192	25.2	2340	31.4								
15000	1636	1977	15.8	2136	21.9	2285	28.1										
16000	1745	2087	18.3	2239	24.8	2380	31.3										

Performance certified for installation Type B: free inlet/ducted outlet. Power rating (BHP) includes transmission losses. Performance data is based on standard air conditions (0.075 #/ft.3). Performance ratings do not include the effects of appurtenances (accessories). MOST EFFICIENT FAN SELECTION APPEARS IN BOLD PRINT. To complete model code, add arrangement, class of construction, motor enclosure code, motor horsepower code and motor speed code. Refer to page 2 for more information.



Performance Data

Class I Class II

A40-_-33_FA100FG

Wheel Diameter: 33.0 in.
Outlet Area: 11.04 sq. ft.

CFM	Outlet Velocity FPM	Static Pressure															
		1"		2"		3"		4"		5"		6"		7"		8"	
		RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
9000	815	656	2.48	805	4.49	934	6.60										
10500	951	720	3.20	847	5.35	973	7.83	1081	10.3								
12000	1087	789	4.09	900	6.42	1012	9.05	1120	11.9	1215	14.7						
13500	1223	862	5.18	960	7.70	1059	10.5	1158	13.5	1255	16.8	1340	19.9	1421	23.1		
15000	1359	937	6.51	1025	9.20	1114	12.2	1203	15.3	1293	18.8	1380	22.4	1458	25.9	1533	29.4
16500	1495	1015	8.10	1094	11.0	1174	14.1	1255	17.4	1336	21.0	1418	24.8	1497	28.7	1572	32.7
18000	1630	1093	9.97	1166	13.0	1239	16.3	1313	19.9	1387	23.5	1461	27.4	1536	31.6	1610	35.9
19500	1766	1173	12.1	1239	15.3	1307	18.8	1375	22.6	1443	26.4	1512	30.5	1580	34.7	1649	39.2
21000	1902	1253	14.7	1315	18.0	1377	21.7	1440	25.6	1503	29.7	1567	33.9	1630	38.2		
22500	2038	1334	17.5	1392	21.1	1450	24.9	1508	28.9	1567	33.2	1626	37.7				
24000	2174	1416	20.8	1470	24.5	1524	28.4	1578	32.7	1633	37.1						
25500	2310	1498	24.4	1548	28.3	1599	32.5	1651	36.9								

A40-_-33_FA-66FG

Wheel Diameter: 33.0 in.
Outlet Area: 11.04 sq. ft.

CFM	Outlet Velocity FPM	Static Pressure															
		2"		4"		6"		8"		9"		10"		11"		12"	
		RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
7500	679	853	3.73	1092	7.36												
9000	815	920	4.64	1142	8.80	1334	13.3										
10500	951	994	5.73	1202	10.4	1379	15.4	1542	20.7								
12000	1087	1076	7.05	1267	12.2	1438	17.7	1588	23.4	1660	26.3	1731	29.4	1802	32.6		
13500	1223	1164	8.68	1338	14.2	1499	20.2	1645	26.5	1713	29.7	1778	32.9	1842	36.2	1905	39.6
15000	1359	1257	10.6	1414	16.4	1566	23.0	1706	29.8	1773	33.3	1836	36.8	1897	40.3	1956	43.9
16500	1495	1352	12.9	1496	19.0	1637	26.0	1771	33.3	1835	37.1	1896	40.9	1957	44.8	2014	48.6
18000	1630	1449	15.6	1582	22.1	1713	29.3	1839	37.1	1901	41.2	1960	45.2	2018	49.4		
19500	1766	1548	18.7	1671	25.5	1793	33.1	1912	41.3	1970	45.5						
21000	1902	1649	22.3	1764	29.4	1877	37.3	1989	45.8								
22500	2038	1750	26.4	1858	33.9	1964	42.0										
24000	2174	1853	30.9	1954	38.8												

A40-_-40_FA100FG

Wheel Diameter: 40.25 in.
Outlet Area: 16.72 sq. ft.

CFM	Outlet Velocity FPM	Static Pressure															
		1"		2"		3"		4"		5"		6"		7"		8"	
		RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
12500	748	519	3.33	648	6.20												
15000	897	575	4.43	684	7.57	789	11.1	879	14.7								
17500	1047	638	5.85	731	9.28	824	13.2	913	17.3	991	21.4						
20000	1196	704	7.64	785	11.4	866	15.5	949	20.0	1028	24.8	1098	29.5	1164	34.2		
22500	1346	774	9.87	845	13.9	917	18.3	989	23.0	1063	28.2	1134	33.6	1198	38.9	1259	44.1
25000	1495	845	12.6	909	16.9	973	21.6	1038	26.6	1103	31.9	1169	37.6	1234	43.6	1295	49.6
27500	1645	917	15.8	975	20.4	1033	25.4	1092	30.8	1152	36.4	1211	42.2	1271	48.4	1330	54.9
30000	1794	991	19.7	1043	24.5	1097	29.8	1151	35.5	1205	41.4	1259	47.5	1313	53.9	1368	60.6
32500	1944	1065	24.1	1113	29.3	1162	34.8	1212	40.8	1262	47.0	1312	53.5	1362	60.1		
35000	2093	1140	29.3	1185	34.7	1230	40.6	1276	46.8	1322	53.3	1368	60.1				
37500	2243	1215	35.2	1257	41.0	1299	47.1	1342	53.6								
40000	2392	1291	41.9	1330	48.0	1369	54.4										

A40-_-40_FA-66FG

Wheel Diameter: 40.25 in.
Outlet Area: 16.72 sq. ft.

CFM	Outlet Velocity FPM	Static Pressure															
		2"		4"		6"		8"		9"		10"		11"		12"	
		RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
14000	837	770	7.32	949	13.7	1101	20.5										
16000	957	826	8.83	994	15.9	1138	23.4	1270	31.3	1335	35.7						
18000	1077	887	10.6	1043	18.3	1182	26.6	1305	35.1	1363	39.5	1421	44.0	1479	48.8		
20000	1196	952	12.8	1095	21.0	1227	30.0	1347	39.3	1403	44.0	1456	48.7	1509	53.6	1561	58.6
22000	1316	1019	15.4	1150	23.9	1276	33.6	1392	43.7	1447	48.8	1498	53.9	1548	59.1	1597	64.3
24000	1435	1089	18.3	1210	27.3	1327	37.5	1438	48.3	1491	53.8	1543	59.4	1592	65.0	1639	70.6
26000	1555	1160	21.8	1272	31.2	1382	41.8	1488	53.2	1539	59.1	1588	65.0	1637	71.0		
28000	1675	1232	25.7	1337	35.6	1440	46.6	1540	58.5	1589	64.7	1637	71.0				
30000	1794	1306	30.1	1404	40.5	1500	51.9	1595	64.3	1642	70.8						
32000	1914	1380	35.1	1472	46.0	1563	57.8	1653	70.6								
34000	2033	1455	40.8	1542	52.0	1628	64.3										
36000	2153	1531	47.0	1613	58.8												

Performance certified for installation Type B: free inlet/ducted outlet. Power rating (BHP) includes transmission losses. Performance data is based on standard air conditions (0.075 #/ft.³). Performance ratings do not include the effects of appurtenances (accessories). MOST EFFICIENT FAN SELECTION APPEARS IN BOLD PRINT. To complete model code, add arrangement, class of construction, motor enclosure code, motor horsepower code and motor speed code. Refer to page 2 for more information.



Performance Data

Class I Class II

A40- -49_FA100FG

Wheel Diameter: 49.0 in.
Outlet Area: 25.22 sq. ft.

CFM	Outlet Velocity FPM	Static Pressure															
		1"		2"		3"		4"		5"		6"		7"		8"	
		RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
21000	833	457	5.98	551	10.5	638	15.5										
24000	952	497	7.51	579	12.4	662	17.9	735	23.6								
27000	1071	539	9.37	612	14.6	686	20.4	759	26.9	823	33.1	882	39.6				
30000	1190	584	11.6	649	17.2	716	23.3	782	30.1	847	37.3	904	44.3	959	51.3		
33000	1308	630	14.3	689	20.2	749	26.7	809	33.7	870	41.3	929	49.2	982	56.9	1032	64.6
36000	1427	677	17.4	731	23.7	786	30.6	841	37.9	896	45.6	952	54.0	1006	62.7	1055	71.1
39000	1546	725	21.1	775	27.6	825	34.9	876	42.6	927	50.7	978	59.2	1029	68.3	1079	77.7
42000	1665	774	25.3	820	32.2	866	39.8	913	47.9	960	56.3	1007	65.1	1055	74.3	1103	84.1
45000	1784	823	30.0	865	37.3	909	45.2	952	53.7	996	62.5	1040	71.6	1084	81.1	1129	91.1
48000	1903	872	35.4	912	43.0	952	51.3	993	60.1	1034	69.3	1075	78.9	1117	88.7		
51000	2022	922	41.5	959	49.5	997	58.0	1035	67.2	1074	76.8	1113	86.8				
54000	2141	972	48.3	1007	56.6	1043	65.5	1079	75.0	1115	84.9						

A40- -49_FA-66FG

Wheel Diameter: 49.0 in.
Outlet Area: 25.22 sq. ft.

CFM	Outlet Velocity FPM	Static Pressure															
		2"		4"		6"		8"		9"		10"		11"		12"	
		RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
18000	714	594	9.07	749	17.5												
21000	833	636	11.0	783	20.6	907	30.8										
24000	952	683	13.3	820	23.9	938	35.2	1045	46.9	1098	53.3						
27000	1071	734	16.1	861	27.6	975	40.0	1075	52.7	1123	59.2	1170	66.0	1217	73.1		
30000	1190	789	19.4	905	31.6	1013	45.0	1111	59.0	1156	66.0	1200	73.1	1243	80.4	1285	87.9
33000	1308	845	23.3	951	36.1	1053	50.5	1148	65.6	1193	73.3	1235	81.0	1276	88.7	1316	96.5
36000	1427	903	27.9	1001	41.3	1097	56.5	1187	72.6	1231	80.8	1273	89.2	1313	97.6	1352	106
39000	1546	962	33.1	1053	47.2	1143	63.0	1229	80.1	1271	88.8	1311	97.7	1350	107		
42000	1665	1022	39.1	1107	53.9	1191	70.3	1273	88.1	1313	97.4	1352	107				
45000	1784	1084	45.9	1163	61.4	1241	78.4	1319	96.9	1357	107						
48000	1903	1145	53.6	1220	69.8	1294	87.5										
51000	2022	1208	62.2	1279	79.1	1348	97.5										

A40- -60_FA100FG

Wheel Diameter: 60.0 in.
Outlet Area: 35.34sq. ft.

CFM	Outlet Velocity FPM	Static Pressure															
		1"		2"		3"		4"		5"		6"		7"		8"	
		RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
30000	849	363	8.31	444	15.0	515	22.0										
35000	990	398	10.7	467	17.9	536	26.1	596	34.3								
40000	1132	437	13.7	497	21.5	558	30.2	618	39.8	670	49.0	719	58.6				
45000	1273	477	17.4	531	25.8	584	35.0	639	45.1	692	55.9	739	66.4	783	77.0		
50000	1415	519	21.9	567	30.9	615	40.7	664	51.2	713	62.6	760	74.6	804	86.3	845	98.0
55000	1556	562	27.3	605	36.8	649	47.3	693	58.3	737	70.1	782	82.7	825	95.9	866	109
60000	1698	606	33.6	645	43.6	685	54.7	725	66.5	766	78.7	806	91.6	847	105		
65000	1839	650	41.0	686	51.6	723	63.2	760	75.6	797	88.5	835	102				
70000	1981	695	49.5	728	60.6	762	72.8	796	85.7	831	99.4						
75000	2122	740	59.2	771	70.9	802	83.6	834	97.1								
80000	2264	785	70.1	814	82.5	844	95.7	873	110								
85000	2405	830	82.5	858	95.5	886	109										

A40- -60_FA-66FG

Wheel Diameter: 60.0 in.
Outlet Area: 35.34sq. ft.

CFM	Outlet Velocity FPM	Static Pressure															
		2"		4"		6"		8"		9"		10"		11"		12"	
		RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
28000	792	492	14.2	617	27.3												
32000	905	524	16.9	643	31.5	743	46.8										
36000	1019	558	20.0	670	35.9	766	52.7	854	70.4	897	80.0						
40000	1132	595	23.6	699	40.7	793	59.2	875	78.0	915	87.8	953	97.9	992	109		
44000	1245	634	27.9	731	46.0	820	65.8	901	86.3	938	96.7	974	107				
48000	1358	675	32.9	764	51.8	849	73.0	928	95.1	964	106						
52000	1471	716	38.7	799	58.4	880	80.6	955	104								
56000	1585	759	45.2	836	65.8	912	89.0										
60000	1698	802	52.6	875	74.0	946	98.1										
64000	1811	846	60.9	915	83.3	982	108										
68000	1924	891	70.2	955	93.5												
72000	2037	936	80.5	997	105												

Performance certified for installation Type B: free inlet/ducted outlet. Power rating (BHP) includes transmission losses. Performance data is based on standard air conditions (0.075 #/ft.3). Performance ratings do not include the effects of appurtenances (accessories). MOST EFFICIENT FAN SELECTION APPEARS IN BOLD PRINT. To complete model code, add arrangement, class of construction, motor enclosure code, motor horsepower code and motor speed code. Refer to page 2 for more information.



Options and Accessories

Fiberglass In-line Centrifugal Fan Accessories

Companion Flanges

Drilled to fit the flanges of the fan; allows easy installation. Fiberglass construction.

Drain

Fiberglass bulkhead fitting assembled in housing, NPT female threaded fitting. 1" NPT on Series 40. Plug not provided.



Inspection Door

Allows periodic visual inspection of wheel. Fiberglass construction fastened with stainless steel bolts and gasketed for tight seal.



Fiberglass Motor Cover

Designed to fit fiberglass in-line centrifugal fan. Covers are solid fiberglass, die-formed, with injection molded louvers.



Combination Motor Cover and Belt Guard

Designed to fit belt drive in-line centrifugal fans. Covers are vented. Specify horizontal or vertical mounting. Steel construction, epoxy coated.



Belt Guard

Covers motor sheave and belts outside fan housing. Steel construction, epoxy coated.

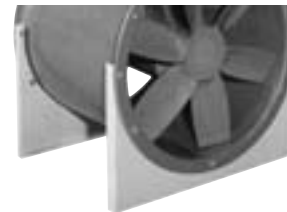
Guards

Inlet and outlet guards are available for fiberglass axial flow units. OSHA style. Steel construction, epoxy coated.



Mounting Feet/Ceiling Suspension

Bolted to the inlet and discharge flanges, mounting feet allow positioning of the duct fan on the floor, ceiling, wall or platform. Can be used with vibration isolators. Steel construction, epoxy coated.



Vibration Isolators

Rubber-in-shear or spring type isolators available on all models. When using vibration isolators, mounting feet or panel must be specified.

V-Belt Drives

Constant speed (fixed pitch) or adjustable speed (variable pitch) oil, heat, and static resistant type V-Belt Drives, oversized for long life and continuous duty as standard, are available upon request.

Inlet Control Damper

Dampers are mounted on the blower's drilled inlet flange to both increase the efficiency of the system and permit control of air volume. Dampers epoxy coated, or of stainless steel.



Roof Mounted Upblast

Together with a fiberglass curb panel and fiberglass stack cap, the Hartzell fiberglass in-line centrifugal fan can be mounted as a roof exhauster. Stack cap has back draft dampers to provide weather tight closure for vertical air discharge.

Hooded

When required, the Hartzell fiberglass in-line centrifugal fan can be supplied with a fiberglass weather hood. These power roof ventilators can be used for intake or exhaust.



Caution: The drive assembly or the periphery of the blades of a fan less than seven (7) feet above the floor or working level must be in accordance with OSHA regulations.

SAFETY ACCESSORIES, APPLICATION AND USE WARNING

The safe application and use of equipment supplied by Hartzell Fan, Inc. is the responsibility of the installer, the user, the owner, and the employer. Since the application and use of its equipment can vary greatly, Hartzell Fan, Inc. offers various product types, optional safety accessories, and sound performance data per laboratory tests. Hartzell Fan, Inc. sells its equipment with and without safety accessories, and accordingly, it can supply such safety accessories only upon receipt of an order. The need for safety accessories will frequently depend upon the type of system, fan location and operating procedures being employed. The proper protective safety accessories to meet company standards, local codes, and the requirements of the Occupational Safety and Health Act must be determined by the user since safety requirements vary depending on the location and use of the equipment. If applicable local conditions, standards, codes or OSHA rules require the addition of the safety accessories, the user should specify and obtain the required safety accessories from Hartzell Fan, Inc. and should not allow the operation of the equipment without them.

Owners, employers, users and installers should read "RECOMMENDED SAFETY PRACTICES FOR USERS AND INSTALLERS OF INDUSTRIAL AND COMMERCIAL FANS" published by the Air Movement and Control Association International, Inc., 30 West University Drive, Arlington Heights, Illinois 60004. A copy of this publication is enclosed with each fan shipped from Hartzell Fan, Inc., and is available upon request at Hartzell's office in Piqua, Ohio 45356.

Please contact Hartzell Fan, Inc. or your local Hartzell representative for more information on product types, safety accessories, and sound performance estimates.

Remember, the selection of safety accessories and the safe application and use of equipment supplied by Hartzell Fan, Inc. is **your** responsibility.



General Construction Options

Abrasive/Erosive Resistant Coating

HartKoate is an abrasive/erosive resistant coating developed by Hartzell Fan for application in environments where abrasive/erosive conditions may exist. HartKoate helps prevent premature deterioration of equipment in environments where uncoated fans may fail.

Impact resistant HartKoate is applied to a 50-60 mil thickness suitable for temperatures to 200°F.

HartKoate is particularly appropriate for use when water mist and/or abrasive particles exist in the airstream.

Contact your Hartzell representative for further details concerning the application of HartKoate coating to fiberglass fans in corrosive atmospheres.

Hi-Cor Construction

All airstream surfaces exposed to corrosive environment will be protected with a layer of Synthetic (Nexus) surfacing veil. An additional final coat of resin will be applied for extra corrosion resistance.

When Hi-Cor construction is required, the factory should be consulted concerning the corrosive environment involved.

Electrostatically Grounded Fiberglass Fans

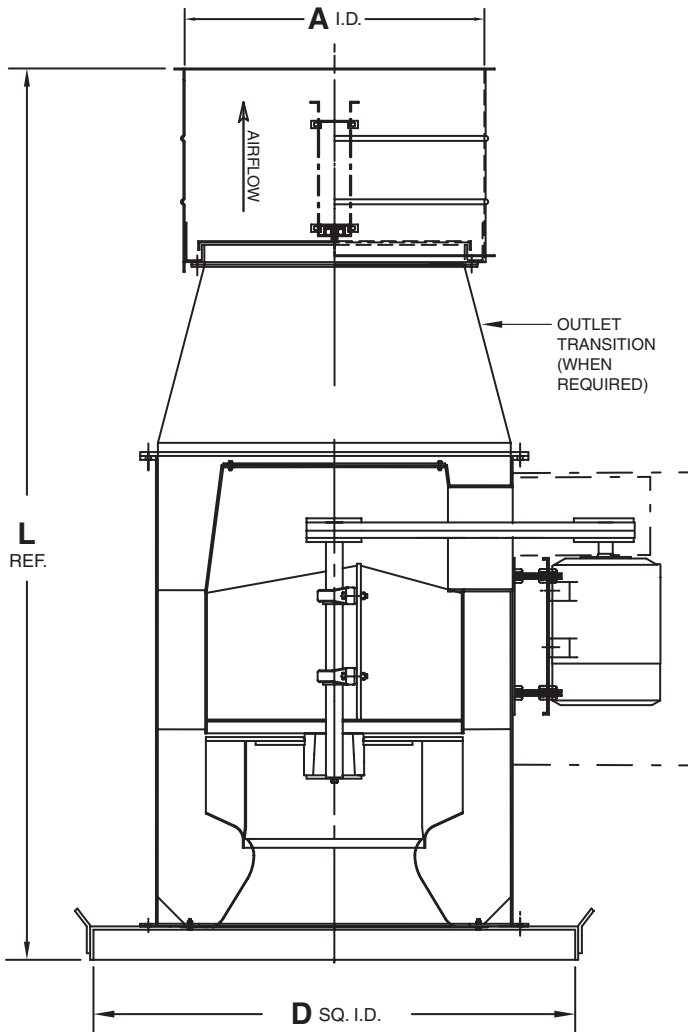
For applications in which fiberglass fans are handling gas fumes that are not only corrosive but also potentially explosive, the equipment should be specially constructed to control and remove static electricity. Interior airstream surfaces can be coated with a "carbon rich" resin coat and grounding straps secured from the side of the housing to the fan's steel base. All that remains to effectively ground the airstream is to ground the fan base at the time of installation.

ASTM D4167-97 Construction

ASTM D4167-97, Standard Specification for Fiber-Reinforced Plastic Fans and Blowers. For corrosive systems where ASTM construction is specified this construction option adds: Synthetic veil and electrostatically conductive surface coating applied to airstream housing and impeller surfaces, special nameplates, and special final dynamic balancing to fan.

**CONTACT YOUR LOCAL HARTZELL REPRESENTATIVE FOR ASSISTANCE.
1-800-336-3267**

Power Roof Ventilator



CFM Limitations for Damper Lids Operation

Fan Size	Without Outlet Transition		With Outlet Transition	
	Minimum*	Maximum**	Minimum*	Maximum**
12	2,615	5,975	1,195	2,725
15	3,210	7,335	2,080	4,750
22	8,065	18,435	6,200	14,175
27	12,525	28,630	8,065	18,435
33	15,120	34,560	12,525	28,630
40	22,890	52,315	17,960	41,055
49	C.F.	C.F.	22,890	52,315
60	C.F.	C.F.	28,180	64,410

* Minimum CFM to Open Lids.

** Maximum CFM to prevent lid damage.

C.F. Contact Factory for ratings.

Fan Size	D	Est Weight (lbs)	Without Outlet Transition		With Outlet Transition	
			A	L	A	L
12	26	200	24%	47%	16%	55%
15	28	274	24%	58%	20%	66
22	40½	553	37	71%	33	77%
27	50	687	49%	77	37	91%
33	52¾	1,163	49%	91%	49%	102%
40	63¾	1,650	61%	101%	55%	112%
49	75%	2,403	---	---	61%	140%
60	91%	3,351	---	---	68	167%

Guy wire bracing must be provided by customer when necessary. Dimensions and specifications are subject to change. Certified prints are available.

Installation weight is approximate and is less motor, drives, and optional equipment.



Hartzell Warranty

LIMITED WARRANTIES

Hartzell represents to Buyer that any goods to be delivered hereunder will be produced in compliance with the requirements of the Fair Labor Standards Act of 1938 as amended.

Hartzell also warrants to Buyer its goods to be free from defects in workmanship and material under normal use and service for one (1) year after tender of delivery by Hartzell, plus six (6) months allowance for shipment to approved stocking dealers & distributors. No warranty extends to future performance of goods and any claims for breach of warranty or otherwise accrues upon tender of delivery. The foregoing constitute Hartzell's sole and exclusive warranties in lieu of all other warranties, whether written, oral, express, implied or statutory.

LIMITATION OF LIABILITY FOR BREACH OF WARRANTY

Hartzell's obligation for any breach of warranty is limited to repairing or replacing, at its option, without cost to Buyer at its factory any goods which shall, within such a warranty period, be returned to it with transportation charges prepaid, and which its examination shall disclose to its satisfaction to have been defective. Any request for repair or replacement should be directed to Hartzell Fan, Inc., P.O. Box 919, Piqua, Ohio 45356. Hartzell will not pay for any repairs made outside its factory without its prior written consent. This does not apply to any such Hartzell goods which have failed as a result of faulty installation or abuse, or incorrect electrical connections or alterations, made by others, or use under abnormal operating conditions or misapplication of the goods.

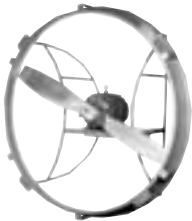
LIMITATION OF LIABILITY

To the extent the above limitation of liability for breach of warranty is not applicable, the liability of Hartzell on any claim of any kind, including negligence, for any loss or damage arising out of or connected with, or resulting from the sale and purchase of the goods or services covered by these Terms and Conditions of Sale or from the performance or breach of any contract pertaining to such sale or purchase or from the design manufacture, sale, delivery, resale, installation, technical direction installation, inspection repair, operation or use of any goods or services covered by these Terms and Conditions shall, in no case exceed the price allocable to the goods or services which gave rise to the claim and shall terminate one year after tender of delivery of said goods or services.

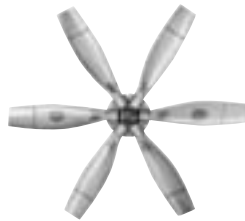
In no event whether as a result of breach of contract, or warranty or alleged negligence, defects incorrect advice or other causes, shall Hartzell be liable for special or consequential damages, including, but not limited to, loss of profits or revenue, loss of use of the equipment or any associated equipment, cost of substitute equipment, facilities or services, down time costs, or claims of customers of the Buyer for such damages. Hartzell neither assumes nor authorizes any person to assume for it any other liability in connection with the sale of its goods or services.

NO IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS.

HARTZELL DOES NOT WARRANT THAT SAID GOODS ARE OF MERCHANTABLE QUALITY OR THAT THEY ARE FIT FOR ANY PARTICULAR PURPOSE. THERE IS NO IMPLIED WARRANTY OF MERCHANTABILITY AND THERE IS NO IMPLIED WARRANTY OF FITNESS.



Propeller Fans



Cooling Tower & Heat Exchanger Fans



Duct Fans



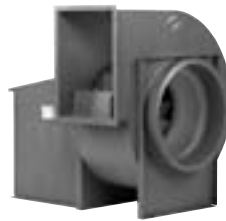
Duct Axial Fans



Vaneaxial Blowers



Cool Blast & Utility Fans



Steel Centrifugal Blowers



Roof Ventilators - Steel & Fiberglass



Heating Equipment - Gas & Steam



Fiberglass Axial Flow Fans



Fiberglass Centrifugal Blowers



Marine - Mine Duty Blowers

Hartzell Fan, Inc., Piqua, Ohio 45356 • Plants in Piqua, Ohio and Portland, Indiana.