

## AIR MOVEMENT

SERIES28,28B,29,29B,34,35, 35V



# THE HARTZELL DIFFERENCE

Building the highest quality fans in America for generations



## QUALITY AT EVERY TURN.

Hartzell Air Movement exceeds the standard in the air movement industry, committed to delivering top-quality, reliable products. And our relationship with our customers, and our knowledgeable, inventive, flexible and hardworking employees are the reasons we've continued and thrived, right here in the USA, for six generations.

Customers choose Hartzell for our:

- Durability and high performance
- Low cost of ownership
- Leadership in performance testing and certification
- Advanced engineering and manufacturing processes
- Innovative design and manufacturing
- Trusted brand name

### Experienced Hartzell team to assist you from design to shipping

ISO9001:2015 Certification  
AMCA Accredited Laboratory  
Complete Fans and Blowers  
Centrifugal Wheels  
Airfoil Propellers



ISO  
9001:2015  
REGISTERED



For more information, contact your local Hartzell Sales Representative. [info@hartzell.com](mailto:info@hartzell.com)

## HARTZELL ADVANTAGES

### A LIFETIME OF VALUE

- ☐ Industrial fans are field proven, 100% tested, with virtually no incident of return
- ☐ Energy efficient designs that provide a lower total cost of ownership

### LEADERSHIP IN PERFORMANCE

- ☐ Products certified by AMCA that meet DOE recommended efficiencies
- ☐ Highly efficient industrial fan designs that are the quietest in the market
- ☐ Airfoil shape blades with industry leading measured efficiencies

### ADVANCED ENGINEERING & MANUFACTURING

- ☐ Proven manufacturing techniques on state of the art equipment in ISO 9001:2015 registered facilities
- ☐ Engineering team utilizes the latest design tools in 3D CAD and other modeling software

### CREATIVE DESIGN & MANUFACTURING TEAM

- ☐ Offering the greatest number of industrial fan design choices
- ☐ Building products to meet your rigorous application; no limiting catalog

### TRUSTED BRAND NAME

- ☐ Extensive talent pool bringing over 145 years of knowledge and experience to you

### 5-YEAR WARRANTY

- ☐ The industry's first and only manufacturer that stands behind their products for a full 5-years



- ☒ Register your 5 year warranty
- ☒ Download your installation manual
- ☒ Order replacement parts

## HARTZELL WARRANTY

LIMITED WARRANTIES, LIMITATION OF LIABILITY, AND  
LIMITATION OF LIABILITY FOR BREACH OF WARRANTY

### 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.

The details of the Hartzell warranty can be found at  
<http://www.hartzellairmovement.com/warranty-service>

## PERFORMANCE GUARANTEED

Your products are only as good as the components that go into them. We know you have high expectations, and so does Hartzell Air Movement. We know you expect the most reliable and durable industrial air movement products available, so we're holding ourselves to a higher standard. We're so sure that our products will out-perform industry standards, we're backing that promise with the industry's first – and only – five-year warranty.

At Hartzell, these are words we live by. They guide us every day. Good enough isn't how you design your products. It's not how we engineer, build and support our products — or provide ongoing service to our customers. When we looked at the industry standard two-year warranty, we knew we had to do better. And we did — by offering the Hartzell

**FIVE-YEAR WARRANTY.**

Register for your 5year warranty at  
<https://www.hartzellairmovement.com/warranty-and-parts/five-year-warranty>

Hartzell Air Movement  
proudly manufactures  
our fans right here in  
the USA!



**MADE IN  
U.S.A.**

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ADVANTAGES OF FIBERGLASS AXIAL FLOW FANS

A variety of corrosion problems plague the water and wastewater industry. Although fans and blowers made of coated steel or aluminum are available, they are often subject to corrosion problems. Hartzell's fiberglass fans and blowers are made of a special resin that provides unsurpassed resistance to a great majority of corrosive elements at a cost substantially below that of corrosion resistant metals.

ADVANTAGES

FIBERGLASS OFFERS SUPERIOR CORROSION RESISTANT PROPERTIES

- ✓ Weighs 25% - 50% less than comparable equipment made of metal alloys
- ✓ Has an extremely high strength-to-weight ratio, stronger than steel on a per-pound basis
- ✓ Has excellent dimensional stability
- ✓ Will not become brittle at low temperatures and at -40°F laminated fiberglass will be stronger than at room temperature
- ✓ Offers a distinct price advantage over stainless and Monel (as much as 1/3 in original cost)
- ✓ Has a longer service life and requires less maintenance
- ✓ Offers weather-resistant characteristics – it will not tarnish and will never need painting
- ✓ Is extremely durable and highly resistant to impact

When optional surface veil, electrical grounding and dynamic balancing are applied, Hartzell Air Movement conforms to ASTM D4167-21 and ASTM E84-2008 Standard Specifications for Fiber-Reinforced Plastic (FRP) Fans and Blowers.

SUPERIOR CORROSION RESISTANCE

RESIN TRANSFER MOLDED



Hartzell offers the ONLY fiberglass wheels & propellers available in solid, one-piece design from the mold.

- ✓ Solid, one-piece design from an RTM mold – up to 60" dia.
- ✓ Consistent wheels and propellers with 98%+ exact wheels and propellers. Only variation is in the requested finishes.
- ✓ Repeatable Process
- ✓ Available in 12" - 60" diameters
- ✓ Much stronger wheels and propellers

Hartzell's fiberglass wheels and propellers are unique in the fan and blower industry.

They are manufactured as a single fiberglass piece using a multi-section RTM mold, ensuring that each wheel and prop is aerodynamically identical and provides reliable, repeatable performance without the variability of hand-made and taped components.

The superior design is a result of a substantial investment in research, development, tooling, and manufacturing methods by Hartzell Air Movement.

FIBERGLASS AXIAL FLOW FANS

Standard Construction

- **FRP Construction** – 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. Corrosion resistant vinylester resin, having a Class I flame spread rate of 25 or less is used for all housings and propellers.
- **Hardware** – All internal hardware (airstream) is Type 304 stainless steel and 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.
- **Propellers** – One piece construction, die formed of individual laminations of cloth mat plus woven roving. Adjustable pitch propellers incorporate die-formed blades.

For Belt Drive Units:

- **Fan shafts** – 304 stainless steel, turned, ground, polished, and keyed at both ends. Shafts are sized to operate well below

critical speed. 316 stainless steel or monel shafting is available as an option at extra cost.

- **Shaft Seal** – A fiberglass and neoprene shaft seal is placed where the shaft leaves the bearing cover along with a neoprene shaft slinger between the seal and wheel on belt drive units. The seal is not gas tight.
- **Bearings** – 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.
- **Bearing covers** – Sealed with foam gasket and bolted to the bearing base.
- **V-Belt Drives** – Oversized for long life and continuous duty. Fixed pitch or variable pitch drives are available upon request. Belts are oil, heat, and static resistant type.

Discharge Cones

Performance Data Charts for axial flow fans with inlet and outlet ducts of the same diameter as the fan can be found at [www.hartzellflow.com](http://www.hartzellflow.com). Discharge cones may be used on the duct fans to adapt to larger diameters (see Fig. A). The result is a static pressure regain.

Table 2 shows the amount of additional static pressure capability, which results from using the discharge cone. Add the amount of .45 (VP<sub>1</sub>-VP<sub>2</sub>) to the fan's static pressure.  
**SP<sub>2</sub> = SP<sub>1</sub> + .45(VP<sub>1</sub>-VP<sub>2</sub>)**

Thus, a fan selected for 4000 FPM O.V. at 3/4" SP using a size 18"-21" cone, the static pressure capability would be raised from .750" to .957" static pressure. Regain calculations are approximate and are not part of the AMCA certified ratings. Discharge cones may also be used to transform large ducts to the fan inlet size (see Fig. B). Since these cones have gently tapered sides, the friction loss is negligible, about .08 x the difference in velocity pressures (see Table 2).

If the fan is to be used with ducts smaller in diameter than the unit (see Fig. C), the difference in velocity pressure across the cone must be added to the static pressure for which the fan is used.

Table 1: Additional Static Pressure Capability (Regain) Inches W.G.

| F.P.M. VELOCITY | PRESSURE INCHES | F.P.M. VELOCITY | PRESSURE INCHES | F.P.M. VELOCITY | PRESSURE INCHES |
|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| 1000            | 0.012           | 2750            | 0.09            | 4500            | 0.261           |
| 1250            | 0.020           | 3000            | 9               | 4750            | 0.290           |
| 1500            | 0.029           | 3250            | 0.11            | 5000            | 0.323           |
| 1750            | 0.040           | 3500            | 7               | 5250            | 0.356           |
| 2000            | 0.052           | 3750            | 0.13            | 5500            | 0.392           |
| 2250            | 0.065           | 4000            | 8               | 5750            | 0.428           |
| 2500            | 0.081           | 4250            | 0.16            | 6000            | 0.467           |

Note: For an included cone angle of 25°-30°.

Figure A

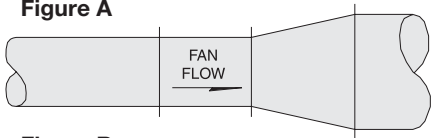


Figure B

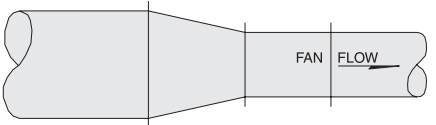


Figure C

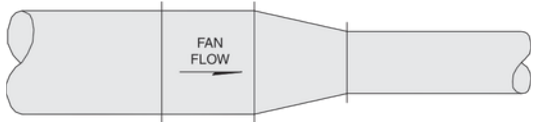


Table 2: Corresponding Air Velocities for Various Pressures in Inches of Water (Air Weight = .07488 lbs. per cu. ft.)

| F.P.M. VELOCITY | PRESSURE INCHES | F.P.M. VELOCITY | PRESSURE INCHES |
|-----------------|-----------------|-----------------|-----------------|
| 500             | 0.003           | 2250            | 0.2260          |
| 600             | 0.0156          | 2500            | 0.316           |
| 700             | 0.0225          | 2750            | 0.391           |
| 800             | 0.0305          | 3000            | 0.473           |
| 900             | 0.0400          | 3250            | 0.562           |
| 1000            | 0.0504          | 3500            | 0.661           |
| 1100            | 0.0625          | 3750            | 0.768           |
| 1200            | 0.0758          | 4000            | 0.880           |
| 1300            | 0.0900          | 4250            | 1.000           |
| 1400            | 0.1060          | 4500            | 1.130           |
| 1500            | 0.1220          | 4750            | 1.265           |
| 1600            | 0.1410          | 5000            | 1.410           |
| 1700            | 0.1600          | 5250            | 1.560           |
| 1800            | 0.1810          | 5500            | 1.720           |
| 1900            | 0.2030          | 5750            | 1.890           |
|                 | 0.2260          |                 | 2.060           |

# Options and Accessories

## Abrasive/Erosive Resistant Coating

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

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 the 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

For applications in which fiberglass products 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.

Grounding straps are 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 D4167-21 Construction

(ASTM D4167-21, 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.

## Companion Flanges

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

## Fiberglass Motor Cover

Designed to fit fiberglass duct and duct axial fans. The cover is solid fiberglass and die-formed with injection molded louvers.

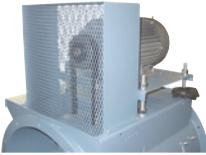


## Combination Motor Cover & Belt Guard

Designed to fit belt driven duct fans. Covers are vented. Specify horizontal or vertical mounting. Epoxy coated steel construction.

## Belt Guard

Covers motor sheave and belts outside the fan housing. Epoxy coated steel construction.



## Mounting Feet/Ceiling Suspension

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



## Inlet and Outlet Guards

Constructed of epoxy coated steel or stainless steel. OSHA approved.



## Roof Mounted – Upblast

Together with a fiberglass curb panel and fiberglass stack cap, a Hartzell Duct Fan or Bifurcated Fan can be mounted as a roof exhaust. The stack cap has back draft dampers to provide a weather-tight closure for vertical air discharge.



## Roof Mounted – Hooded

When required, a Hartzell Duct Fan or Bifurcated Fan can be supplied with a fiberglass weather hood. These power roof ventilators can be used for intake or exhaust.



# Series 28 & 29

## Fiberglass Duct & Duct Axial® Flow Fans, Direct Drive

Hartzell Series 28 and Series 29 Fiberglass Duct and Duct Axial® Flow Fans are engineered and built to be installed in duct systems for process ventilation applications in corrosive environments. The units can be used in any position, from vertical to horizontal.

## Features:

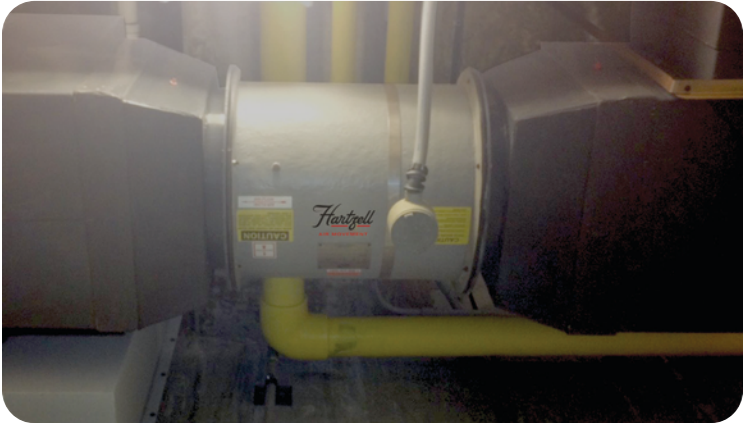
- **Temperature Limitations** – Suitable for temperatures up to 180°F. Note: Temperature correction factors must be applied when operating at other than ambient conditions (70°F). See Maximum Safe Speed Correction Factors chart on page 15. (Specially insulated motors are required for temperatures above 104°F.)
- **Sizes** – 12" to 60"
- **Hardware** – Internal hardware is stainless steel as standard. Monel hardware is available at an extra cost.
- **Rigid Motor Mounts** – Fiberglass supports for foot mounted motors are designed for minimum resistance to airflow.
- **Extended Lube Tubes** – Extended tubes from motor to exterior of fan housing are standard. Extended motor leads to exterior of housing are available as an option.

## SERIES 28 – DUCT FAN

- **Performance** – 1,325 CFM to 66,700 CFM
- **Propellers** – One-piece, solid fiberglass construction
  - Sizes 12" to 48" – 6 blade, Type FW
  - Sizes 54" and 60" – 2 blade, Type M
  - Sizes 54" and 60" – 4 blade\*, Type M*\*Note: The 4-blade propeller is achieved by using (2) 2-blade propellers on a common shaft.*
- **Motor** – Totally enclosed mill and chemical motor is standard. Other motors, including standard totally enclosed are available on request.

## SERIES 29 – DUCT AXIAL® FAN

- **Performance** – 1,204 to 68,950 CFM at free air
- **Propellers** – One-piece, solid fiberglass construction. The 6-blade, Type E, airfoil design with a higher hub-to-blade ratio moves large volumes of air at medium pressures.
- **Motor** – Totally enclosed mill and chemical motors are standard. Other motors, including standard totally enclosed are available on request.
- **Vane section** – The addition of the vane section to the discharge side of a duct axial fan makes it perform efficiently as a low-powered vane axial on the upper side of its pressure curve.



Series 28 Fiberglass Direct Drive Duct Fan in Caustic Soda Room at a Water Treatment Plant



Series 28



Hartzell Air Movement certifies that the Series 03, Backward Curved Centrifugal Fan, shown herein is licensed to bear the AMCA seal for sound and air performance. Ratings are based on tests and procedures performed in accordance with AMCA Standard 211 and 311 comply with the requirements of the AMCA Certified Ratings Program. For performance and sound data, please visit [www.hartzellflow.com](http://www.hartzellflow.com) or contact your local sales representative.

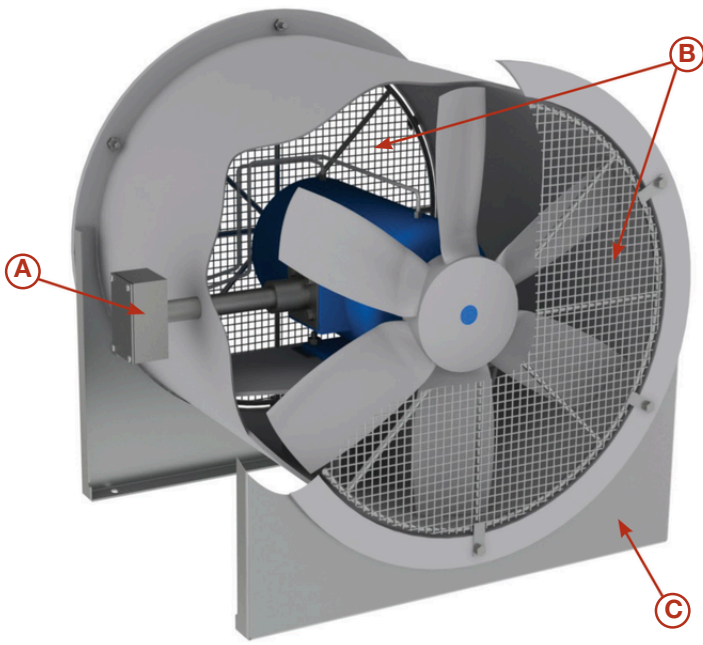


Series 29 (shown)  
Series 29V (with vanes)

The AMCA Certified Ratings Seal does not apply to Series 29, Duct Axial® and 29V Duct Vane axial Fans.

For performance data, please visit [www.hartzellflow.com](http://www.hartzellflow.com) or contact your local sales representative.

Series 28 Sectional View



A. Extended Motor Leads (Optional)

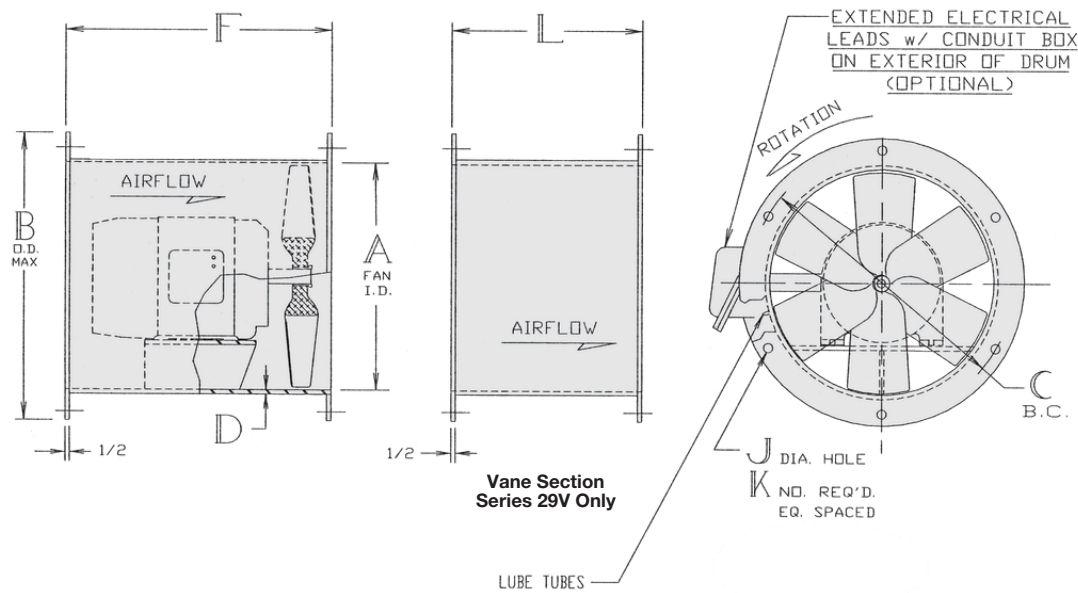
Extension to the exterior of housing allowing for easy access.

B. Inlet and Outlet Guards (Optional)

Epoxy coated steel or stainless steel guards available to protect the propeller.

C. Mounting Feet (Optional)

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



Principal Dimensions (inches) – Series 28, 29, 29V

| Fan Size | A                              | B                              | C                              | D                            | F  | J                            | K  | L  | Max Motor Frame | *Max Fan Weight | Vane Section Weight |
|----------|--------------------------------|--------------------------------|--------------------------------|------------------------------|----|------------------------------|----|----|-----------------|-----------------|---------------------|
| 12       | 12 <sup>7</sup> / <sub>8</sub> | 16 <sup>1</sup> / <sub>4</sub> | 14 <sup>1</sup> / <sub>2</sub> | <sup>3</sup> / <sub>16</sub> | 20 | <sup>5</sup> / <sub>16</sub> | 6  | 6  | 56              | 25              | 15                  |
| 16       | 16 <sup>7</sup> / <sub>8</sub> | 20                             | 18 <sup>1</sup> / <sub>2</sub> | <sup>3</sup> / <sub>16</sub> | 21 | <sup>5</sup> / <sub>16</sub> | 6  | 10 | 182T            | 30              | 20                  |
| 18       | 18 <sup>7</sup> / <sub>8</sub> | 22 <sup>1</sup> / <sub>8</sub> | 20 <sup>1</sup> / <sub>2</sub> | <sup>1</sup> / <sub>4</sub>  | 22 | <sup>5</sup> / <sub>16</sub> | 6  | 11 | 182T            | 45              | 25                  |
| 20       | 20 <sup>7</sup> / <sub>8</sub> | 24 <sup>1</sup> / <sub>8</sub> | 22 <sup>1</sup> / <sub>2</sub> | <sup>1</sup> / <sub>4</sub>  | 25 | <sup>5</sup> / <sub>16</sub> | 6  | 12 | 182T            | 60              | 30                  |
| 24       | 24 <sup>7</sup> / <sub>8</sub> | 28 <sup>1</sup> / <sub>2</sub> | 26 <sup>5</sup> / <sub>8</sub> | <sup>1</sup> / <sub>4</sub>  | 25 | <sup>7</sup> / <sub>16</sub> | 6  | 13 | 182T            | 80              | 40                  |
| 28       | 28 <sup>7</sup> / <sub>8</sub> | 32 <sup>3</sup> / <sub>8</sub> | 30 <sup>5</sup> / <sub>8</sub> | <sup>1</sup> / <sub>4</sub>  | 25 | <sup>7</sup> / <sub>16</sub> | 6  | 13 | 184T            | 100             | 50                  |
| 32       | 33                             | 36 <sup>1</sup> / <sub>2</sub> | 34 <sup>7</sup> / <sub>8</sub> | <sup>1</sup> / <sub>4</sub>  | 28 | <sup>7</sup> / <sub>16</sub> | 6  | 15 | 215T            | 125             | 65                  |
| 36       | 37                             | 40 <sup>5</sup> / <sub>8</sub> | 38 <sup>7</sup> / <sub>8</sub> | <sup>1</sup> / <sub>4</sub>  | 28 | <sup>7</sup> / <sub>16</sub> | 6  | 16 | 215T            | 150             | 80                  |
| 40       | 41                             | 44 <sup>1</sup> / <sub>8</sub> | 43 <sup>3</sup> / <sub>8</sub> | <sup>1</sup> / <sub>4</sub>  | 36 | <sup>7</sup> / <sub>16</sub> | 12 | -- | 256T            | 220             | --                  |
| 44       | 45                             | 48 <sup>3</sup> / <sub>8</sub> | 47 <sup>7</sup> / <sub>8</sub> | <sup>5</sup> / <sub>16</sub> | 36 | <sup>7</sup> / <sub>16</sub> | 12 | 19 | 286T            | 270             | 105                 |
| 48       | 49 <sup>1</sup> / <sub>8</sub> | 53 <sup>3</sup> / <sub>8</sub> | 51 <sup>5</sup> / <sub>8</sub> | <sup>5</sup> / <sub>16</sub> | 36 | <sup>7</sup> / <sub>16</sub> | 12 | 22 | 326T            | 335             | 135                 |
| 54       | 55 <sup>3</sup> / <sub>8</sub> | 59 <sup>5</sup> / <sub>8</sub> | 57 <sup>7</sup> / <sub>8</sub> | <sup>5</sup> / <sub>16</sub> | 40 | <sup>7</sup> / <sub>16</sub> | 12 | 23 | 364T            | 410             | 160                 |
| 60       | 61 <sup>3</sup> / <sub>8</sub> | 65 <sup>5</sup> / <sub>8</sub> | 63 <sup>7</sup> / <sub>8</sub> | <sup>5</sup> / <sub>16</sub> | 40 | <sup>7</sup> / <sub>16</sub> | 12 | 25 | 364T            | 480             | 190                 |

\*Weight without motor and accessories.

Series 28B & 29B

Fiberglass Axial Flow Bifurcated Fans, Direct Drive

Hartzell Series 28B and 29B Fiberglass Axial Flow Bifurcated Fans are designed and built to be used in a variety of corrosive applications. They can be installed in any position from vertical to horizontal and provide an excellent alternative to belt drive fans because the direct drive motor requires minimal periodic maintenance. Series 28B utilizes the Type FW propeller for low pressure applications and Series 29B utilizes the Type E propeller for medium pressure applications.

Features:

- **Temperature Limitations** – Suitable for temperatures up to 200°F. Note: Temperature correction factors must be applied when operating at other than ambient conditions (70°F). See Maximum Safe Speed Correction Factors chart on page 15. (Specially insulated motors are required for temperatures above 104°F.)
- **Sizes** – 24" – 48"
- **Performance** – 6,012 CFM to 46,145 CFM at free air
- **Propellers** – One-piece construction, die formed of individual laminations of fiberglass, cloth mat, plus woven roving
  - Sizes 24" to 48" – 6-blade, Type FW, low pressure
  - Sizes 24" to 48" – 6-blade, Type E, medium pressure
- **Motor** – Extended shaft, C-face, TEFC motors are standard. Mill and chemical duty motors are available. Contact factory for availability of other motor enclosures.
- **Motor Mount** – C-face mounted, directly connected to prop with motor body enclosed in aerodynamic tube and protected from the airstream.
- **Shaft Seal** – A neoprene, sandwich-type design seals the motor shaft at the inner tube.
- **Extended Lube Tubes** – An extended lubrication tube from the motor to the external duct surface of motor mounting tube is standard.

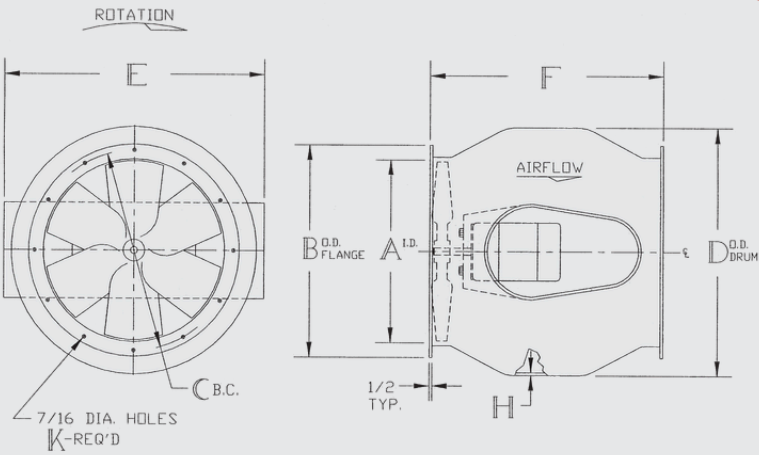


Series 28B  
Type FW Low Pressure Propeller



Series 29B  
Type E Medium Pressure Propeller

For performance data, please visit [www.hartzellflow.com](http://www.hartzellflow.com) or contact your local sales representative.



Principal Dimensions (inches) – Series 28B & 29B

| Fan Size | A                              | B                              | C                              | D                              | E                              | F  | H                            | K  | Series 28B Weight Less Motor | Series 29B Weight Less Motor | Maximum Motor Frame |
|----------|--------------------------------|--------------------------------|--------------------------------|--------------------------------|--------------------------------|----|------------------------------|----|------------------------------|------------------------------|---------------------|
| 24       | 24 <sup>7</sup> / <sub>8</sub> | 28 <sup>1</sup> / <sub>2</sub> | 26 <sup>5</sup> / <sub>8</sub> | 33 <sup>3</sup> / <sub>8</sub> | 36                             | 32 | <sup>1</sup> / <sub>4</sub>  | 6  | 114                          | 115                          | 182TC               |
| 28       | 28 <sup>7</sup> / <sub>8</sub> | 32 <sup>3</sup> / <sub>8</sub> | 30 <sup>5</sup> / <sub>8</sub> | 34 <sup>1</sup> / <sub>2</sub> | 36                             | 33 | <sup>1</sup> / <sub>4</sub>  | 6  | 147                          | 153                          | 184TC               |
| 32       | 33                             | 36 <sup>1</sup> / <sub>2</sub> | 34 <sup>7</sup> / <sub>8</sub> | 42 <sup>1</sup> / <sub>2</sub> | 44 <sup>3</sup> / <sub>4</sub> | 43 | <sup>1</sup> / <sub>4</sub>  | 6  | 190                          | 194                          | 215TC               |
| 36       | 37                             | 40 <sup>5</sup> / <sub>8</sub> | 38 <sup>7</sup> / <sub>8</sub> | 45 <sup>1</sup> / <sub>2</sub> | 47 <sup>3</sup> / <sub>4</sub> | 45 | <sup>1</sup> / <sub>4</sub>  | 6  | 223                          | 234                          | 215TC               |
| 40       | 41                             | 44 <sup>1</sup> / <sub>4</sub> | 43 <sup>1</sup> / <sub>8</sub> | 51 <sup>5</sup> / <sub>8</sub> | 54                             | 49 | <sup>5</sup> / <sub>16</sub> | 12 | 347                          | 360                          | 256TC               |
| 44       | 45                             | 48 <sup>1</sup> / <sub>8</sub> | 47 <sup>1</sup> / <sub>8</sub> | 58 <sup>5</sup> / <sub>8</sub> | 60 <sup>5</sup> / <sub>8</sub> | 51 | <sup>5</sup> / <sub>16</sub> | 12 | 390                          | 409                          | 284TC               |
| 48       | 49 <sup>1</sup> / <sub>8</sub> | 53 <sup>3</sup> / <sub>8</sub> | 51 <sup>5</sup> / <sub>8</sub> | 61 <sup>7</sup> / <sub>8</sub> | 63 <sup>7</sup> / <sub>8</sub> | 58 | <sup>5</sup> / <sub>16</sub> | 12 | 439                          | 476                          | 286TC               |

# Series 34

## FiberglassDuct Fan, Belt Drive

Series34 Fiberglass DuctFans areengineeredfor installation in duct systems for process ventilation applications where the nature of the corrosive airstream warrants isolation of the motor and drive assembly from the airstream. They are best suited for applications with low static pressure characteristics from free air to 1" static pressure.

### Features:

- **Temperature Limitations** – Suitable for temperatures up to 200°F. Note: Temperature correction factors must be applied when operating at other than ambient conditions (70°F). See Maximum Safe Speed Correction Factors chart on page 15. (Specially insulated motors are required for temperatures above 104°F.)
- **Sizes** – 12" to 60"
- **Performance** – 1,021 CFM at 1/4" to 43,000 CFM at 1" S.P.
- **Motor** – Motors are exterior mounted out of the airstream. The propeller

shaft rotates in two heavy-duty bearings mounted on fiberglass supports taped to the inner shell with "T" reinforcements. Totally enclosed fan cooled motors are standard. Special motors are available upon request.

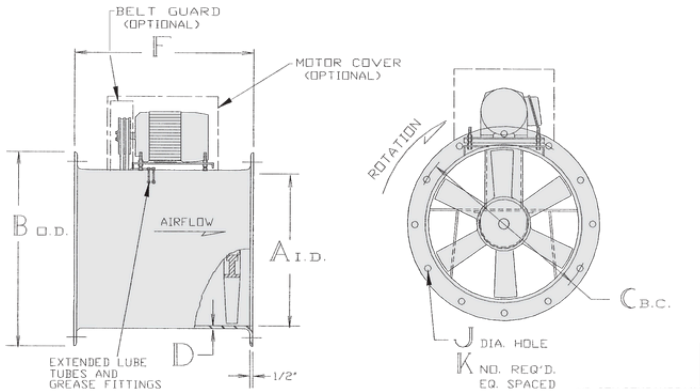
- **Corrosion-Duty Construction** – Belts, bearings, sheaves and shaft are enclosed and protected from the airstream. The drive compartment is located on the negative pressure (suction) side of the propeller drawing ambient air in from outside the fan and over the belts and bearings. This ensures a contaminate-free drive compartment.
- **Propellers** – One piece, solid fiberglass construction
  - Sizes 12" to 48" – 6-blade, Type FW
  - Sizes 54" and 60" – 6-blade adjustable, Type AF
- **Shaft** – Stainless steel with a neoprene slinger, neoprene seal and fiberglass cover plate. Keyed at both ends. Monel shafts available on request.
- **Bearings** – Heavy-duty, self-aligning, deep-row, radial-ball type shielded and mechanically sealed in cast iron or malleable housing. Bearings are relubricable for continuous service. Minimum 50,000 hrs. L-10 bearing life.
- **V-Belt Drives** – Over-sized for long life and continuous duty. Variable pitch drives are standard on units up to and including 10 HP. Variable pitch drives can be furnished on higher horse-power units upon request. Belts are oil, heat and static-resistant type.
- **Extended Lube Tubes** – Extend from bearings to exterior of fan housing.
- **Hardware** – Internal bolts are stainless steel and resin coated after assembly. Monel bolts are optional.



For performance data, please visit [www.hartzellflow.com](http://www.hartzellflow.com) or contact your local sales representative.



Hartzell Air Movement certifies that the Series 03, Backward Curved Centrifugal Fan, shown herein is licensed to bear the AMCA seal for sound and air performance. Ratings are based on tests and procedures performed in accordance with AMCA Standard 211 and 311 comply with the requirements of the AMCA Certified Ratings Program. For performance and sound data, please visit [www.hartzellflow.com](http://www.hartzellflow.com) or contact your local sales representative.



### Principal Dimensions (inches) – Series 34

| Fan Size | A                              | B                              | C                              | D                             | F  | J                              | K  | Max Motor Frame | Max Fan Weight |
|----------|--------------------------------|--------------------------------|--------------------------------|-------------------------------|----|--------------------------------|----|-----------------|----------------|
| 12       | 12 <sup>1</sup> / <sub>8</sub> | 16 <sup>1</sup> / <sub>4</sub> | 14 <sup>1</sup> / <sub>2</sub> | 3 <sup>1</sup> / <sub>8</sub> | 20 | 5 <sup>1</sup> / <sub>16</sub> | 6  | 145T            | 90             |
| 16       | 16 <sup>1</sup> / <sub>8</sub> | 20                             | 18 <sup>1</sup> / <sub>2</sub> | 3 <sup>1</sup> / <sub>8</sub> | 21 | 5 <sup>1</sup> / <sub>16</sub> | 6  | 145T            | 100            |
| 18       | 18 <sup>1</sup> / <sub>8</sub> | 22 <sup>1</sup> / <sub>8</sub> | 20 <sup>1</sup> / <sub>2</sub> | 3 <sup>1</sup> / <sub>4</sub> | 22 | 5 <sup>1</sup> / <sub>16</sub> | 6  | 184T            | 125            |
| 20       | 20 <sup>1</sup> / <sub>8</sub> | 24 <sup>1</sup> / <sub>8</sub> | 22 <sup>1</sup> / <sub>2</sub> | 3 <sup>1</sup> / <sub>4</sub> | 25 | 5 <sup>1</sup> / <sub>16</sub> | 6  | 143T            | 140            |
| 24       | 24 <sup>1</sup> / <sub>8</sub> | 28 <sup>1</sup> / <sub>2</sub> | 26 <sup>5</sup> / <sub>8</sub> | 3 <sup>1</sup> / <sub>4</sub> | 25 | 5 <sup>1</sup> / <sub>16</sub> | 6  | 215T            | 170            |
| 28       | 28 <sup>1</sup> / <sub>8</sub> | 32 <sup>3</sup> / <sub>8</sub> | 30 <sup>3</sup> / <sub>8</sub> | 3 <sup>1</sup> / <sub>4</sub> | 25 | 5 <sup>1</sup> / <sub>16</sub> | 6  | 254T            | 200            |
| 32       | 33                             | 36 <sup>1</sup> / <sub>2</sub> | 34 <sup>7</sup> / <sub>8</sub> | 3 <sup>1</sup> / <sub>4</sub> | 28 | 5 <sup>1</sup> / <sub>16</sub> | 6  | 254T            | 280            |
| 36       | 37                             | 40 <sup>3</sup> / <sub>8</sub> | 38 <sup>7</sup> / <sub>8</sub> | 3 <sup>1</sup> / <sub>4</sub> | 28 | 5 <sup>1</sup> / <sub>16</sub> | 6  | 256T            | 325            |
| 40       | 41                             | 44 <sup>1</sup> / <sub>8</sub> | 43 <sup>1</sup> / <sub>8</sub> | 3 <sup>1</sup> / <sub>8</sub> | 36 | 5 <sup>1</sup> / <sub>16</sub> | 12 | 215T            | 440            |
| 44       | 45                             | 48 <sup>1</sup> / <sub>8</sub> | 47 <sup>1</sup> / <sub>8</sub> | 3 <sup>1</sup> / <sub>8</sub> | 36 | 5 <sup>1</sup> / <sub>16</sub> | 12 | 286T            | 510            |
| 48       | 49 <sup>1</sup> / <sub>8</sub> | 53 <sup>3</sup> / <sub>8</sub> | 51 <sup>1</sup> / <sub>8</sub> | 3 <sup>1</sup> / <sub>8</sub> | 36 | 5 <sup>1</sup> / <sub>16</sub> | 12 | 324T            | 600            |
| 54       | 55 <sup>3</sup> / <sub>8</sub> | 59 <sup>3</sup> / <sub>8</sub> | 57 <sup>5</sup> / <sub>8</sub> | 3 <sup>1</sup> / <sub>8</sub> | 40 | 5 <sup>1</sup> / <sub>16</sub> | 12 | 326T            | 835            |
| 60       | 61 <sup>3</sup> / <sub>8</sub> | 65 <sup>3</sup> / <sub>8</sub> | 63 <sup>3</sup> / <sub>8</sub> | 3 <sup>1</sup> / <sub>8</sub> | 40 | 5 <sup>1</sup> / <sub>16</sub> | 12 | 364T            | 930            |

\*Weight without motor and accessories.

# Series 35

## FiberglassDuct Axial<sup>®</sup> Fan, Belt Drive

Series 35Fiberglass DuctAxial Fans combine many of thebest features of the rugged, highly efficient Vaneaxial Blower with the economical performance of the Hartzell Duct Fan. Duct Axial Fans provide maximum efficiency in the static pressure range from 1" to 3" at low speeds and with surprisingly low noise characteristics. They are designed for duct installations where the nature of the corrosive airstream warrants isolation of the motor and drive assembly from the airstream.

### Features:

- **Temperature Limitations** – Suitable for temperatures up to 200°F. Note: Temperature correction factors must be applied when operating at other than ambient conditions (70°F). See Maximum Safe Speed Correction Factors chart on page 15. (Specially insulated motors are required for temperatures above 104°F.)
- **Sizes** – 12" to 60"
- **Performance** – 600 CFM at 1" to 30,000 CFM at 4 1/2" S.P.
- **Motor** – Motors are exterior mounted out of the airstream. The propeller

shaft rotates in two heavy-duty bearings mounted on fiberglass supports taped to the inner shell with "T" reinforcements. Totally enclosed fan cooled motors are standard. Special motors are available upon request.

- **Corrosion-Duty Construction** – Belts, bearings, sheaves and shaft are enclosed and protected from the airstream. The drive compartment is located on the negative pressure (suction) side of the propeller drawing in ambient air from outside the fan and over the belts and bearings. This ensures a contaminate-free drive compartment.
- **Propellers** – One piece, solid fiberglass construction. The 6-blade, Type E, airfoil design moves large volumes of air at medium pressures.
- **Bearings** – Heavy-duty, self-aligning, deep-row, radial-ball type shielded and mechanically sealed in cast iron or malleable housing. Bearings are relubricable for continuous service. Minimum 50,000 hrs. L-10 bearing
- **V-Belt Drives** – Over-sized for continuous duty. Variable pitch drives are standard on units up to and including 10 HP. Variable-pitch drives can be furnished on higher horsepower units upon request. Belts are oil, heat and static-resistant type.
- **Extended Lube Tubes** – Extend from bearings to exterior of fan housing.
- **Shaft** – Stainless steel and keyed at both ends with a neoprene slinger, neoprene seal, and fiberglass cover plate. Monel shafts are available on request.
- **Hardware** – Internal bolts are stainless steel and resin coated after assembly. Monel bolts are optional.

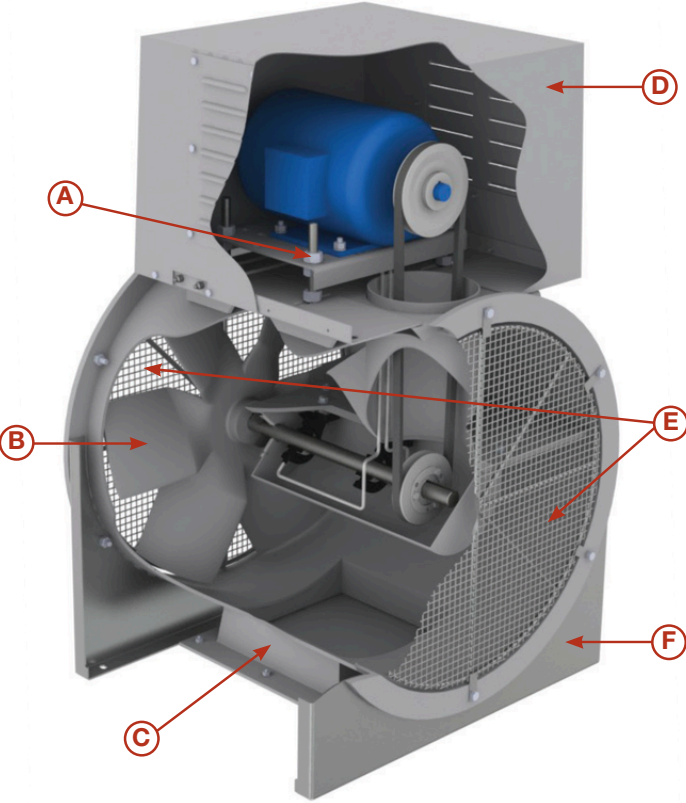


For performance data, please visit [www.hartzellflow.com](http://www.hartzellflow.com) or contact your local sales representative.



Hartzell Air Movement certifies that the Series 03, Backward Curved Centrifugal Fan, shown herein is licensed to bear the AMCA seal for sound and air performance. Ratings are based on tests and procedures performed in accordance with AMCA Standard 211 and 311 comply with the requirements of the AMCA Certified Ratings Program. For performance and sound data, please visit [www.hartzellflow.com](http://www.hartzellflow.com) or contact your local sales representative.

Series 35 Sectional View



**A. Drive Tensioning Bolts**  
Provides easy method to adjust belt tension

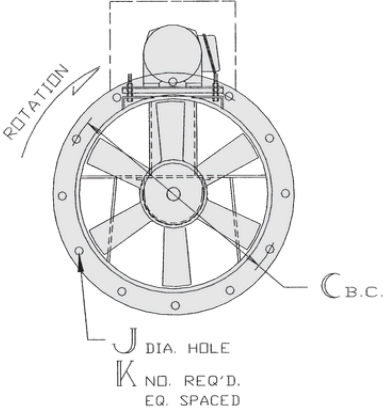
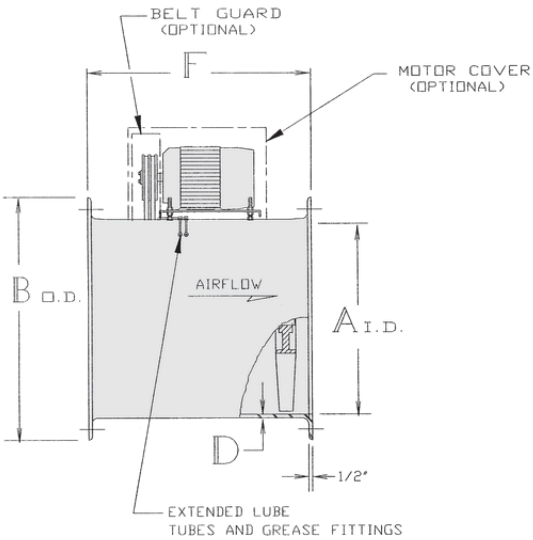
**B. Propeller**  
One piece, solid fiberglass construction, die formed of individual laminations of cloth mat plus woven roving for additional strength. Series 35 fans use a 6-blade (Type E) propeller with an airfoil design to move large volumes of air at medium pressures.

**C. Access Door (Optional)**  
Raised, bolted door held in place with zinc plated bolts and gasketed for a tight seal. Allows for easy access to the propeller compartment.

**D. Motor Cover (Optional)**  
Solid fiberglass construction, die-formed with injection molded louvers. Protects the drive assembly.

**E. Inlet and Outlet Guard (Optional)**  
Epoxy coated steel or stainless steel guards available to protect the propeller.

**F. Mounting Feet (Optional)**  
Bolted to the inlet and discharge flanges, mounting feet allow for positioning of the duct fan on a floor, ceiling, wall or platform. Can be used with vibration isolators. Epoxy coated steel construction.



Principal Dimensions (inches) – Series 35

| Fan Size | A                              | B                              | C                              | D                            | F  | J                            | K  | Max Motor Frame | Max Fan Weight |
|----------|--------------------------------|--------------------------------|--------------------------------|------------------------------|----|------------------------------|----|-----------------|----------------|
| 12       | 12 <sup>1</sup> / <sub>8</sub> | 16 <sup>1</sup> / <sub>4</sub> | 14 <sup>1</sup> / <sub>2</sub> | <sup>3</sup> / <sub>16</sub> | 20 | <sup>5</sup> / <sub>16</sub> | 6  | 145T            | 90             |
| 16       | 16 <sup>1</sup> / <sub>8</sub> | 20                             | 18 <sup>1</sup> / <sub>2</sub> | <sup>3</sup> / <sub>16</sub> | 21 | <sup>9</sup> / <sub>16</sub> | 6  | 145T            | 100            |
| 18       | 18 <sup>1</sup> / <sub>8</sub> | 22 <sup>1</sup> / <sub>8</sub> | 20 <sup>1</sup> / <sub>2</sub> | <sup>1</sup> / <sub>4</sub>  | 22 | <sup>5</sup> / <sub>16</sub> | 6  | 184T            | 125            |
| 24       | 24 <sup>1</sup> / <sub>8</sub> | 28 <sup>1</sup> / <sub>2</sub> | 26 <sup>5</sup> / <sub>8</sub> | <sup>1</sup> / <sub>4</sub>  | 25 | <sup>5</sup> / <sub>16</sub> | 6  | 215T            | 170            |
| 28       | 28 <sup>1</sup> / <sub>8</sub> | 32 <sup>3</sup> / <sub>8</sub> | 30 <sup>5</sup> / <sub>8</sub> | <sup>1</sup> / <sub>4</sub>  | 25 | <sup>9</sup> / <sub>16</sub> | 6  | 254T            | 200            |
| 32       | 33                             | 36 <sup>1</sup> / <sub>2</sub> | 34 <sup>7</sup> / <sub>8</sub> | <sup>1</sup> / <sub>4</sub>  | 28 | <sup>7</sup> / <sub>16</sub> | 6  | 254T            | 280            |
| 36       | 37                             | 40 <sup>3</sup> / <sub>8</sub> | 38 <sup>7</sup> / <sub>8</sub> | <sup>1</sup> / <sub>4</sub>  | 28 | <sup>7</sup> / <sub>16</sub> | 6  | 256T            | 325            |
| 44       | 45                             | 48 <sup>1</sup> / <sub>8</sub> | 47 <sup>1</sup> / <sub>8</sub> | <sup>5</sup> / <sub>16</sub> | 36 | <sup>9</sup> / <sub>16</sub> | 12 | 286T            | 510            |
| 48       | 49 <sup>1</sup> / <sub>8</sub> | 53 <sup>3</sup> / <sub>8</sub> | 51 <sup>5</sup> / <sub>8</sub> | <sup>5</sup> / <sub>16</sub> | 36 | <sup>7</sup> / <sub>16</sub> | 12 | 324T            | 600            |
| 54       | 55 <sup>3</sup> / <sub>8</sub> | 59 <sup>3</sup> / <sub>8</sub> | 57 <sup>5</sup> / <sub>8</sub> | <sup>5</sup> / <sub>16</sub> | 40 | <sup>7</sup> / <sub>16</sub> | 12 | 326T            | 835            |
| 60       | 61 <sup>3</sup> / <sub>8</sub> | 65 <sup>5</sup> / <sub>8</sub> | 63 <sup>5</sup> / <sub>8</sub> | <sup>5</sup> / <sub>16</sub> | 40 | <sup>7</sup> / <sub>16</sub> | 12 | 364T            | 930            |
| 54       | 55 <sup>3</sup> / <sub>8</sub> | 59 <sup>3</sup> / <sub>8</sub> | 57 <sup>5</sup> / <sub>8</sub> | <sup>5</sup> / <sub>16</sub> | 40 | <sup>7</sup> / <sub>16</sub> | 12 | 326T            | 835            |
| 60       | 61 <sup>3</sup> / <sub>8</sub> | 65 <sup>5</sup> / <sub>8</sub> | 63 <sup>5</sup> / <sub>8</sub> | <sup>5</sup> / <sub>16</sub> | 40 | <sup>9</sup> / <sub>16</sub> | 12 | 364T            | 930            |

\*Weight without motor and accessories.

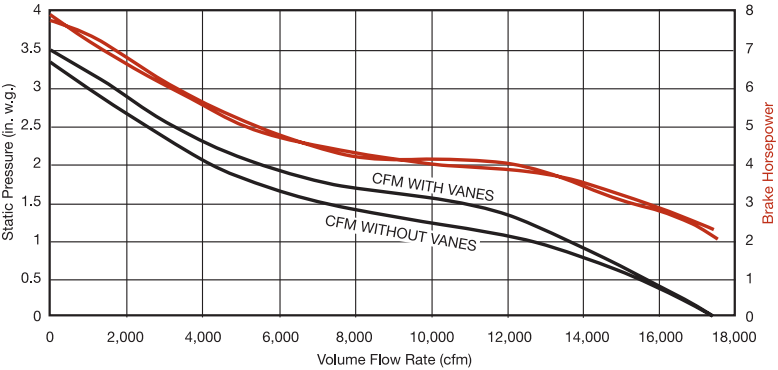
Series 35V

Fiberglass Duct Vaneaxial Fan, Belt Drive

The addition of a specially designed vane section to the Series 35 Fiberglass Duct Axial® Fan changes the design configuration to a Duct Vaneaxial Fan. The addition of the vane section to the discharge side of any duct axial fan makes it perform efficiently as a low-powered vaneaxial on the upper side of its pressure curve. Near free air, the guide vanes offer no advantages, but beyond the mid-range, the vanes provide about 30% more static pressure with the same horsepower.

The purpose of the discharge vane is two-fold. Air leaves any axial fan wheel with a rotational component to the flow that increases from free air to block-off. The rotational component (spin) is straightened by the vanes to give a smoother flow leaving the fan discharge. A large part of the rotational kinetic energy is converted to potential energy resulting in higher static pressure for the fan.

Comparison of 36" Duct Axial Fans: With and Without Vane Section



For performance data, please visit [www.hartzellflow.com](http://www.hartzellflow.com) or contact your local sales representative.



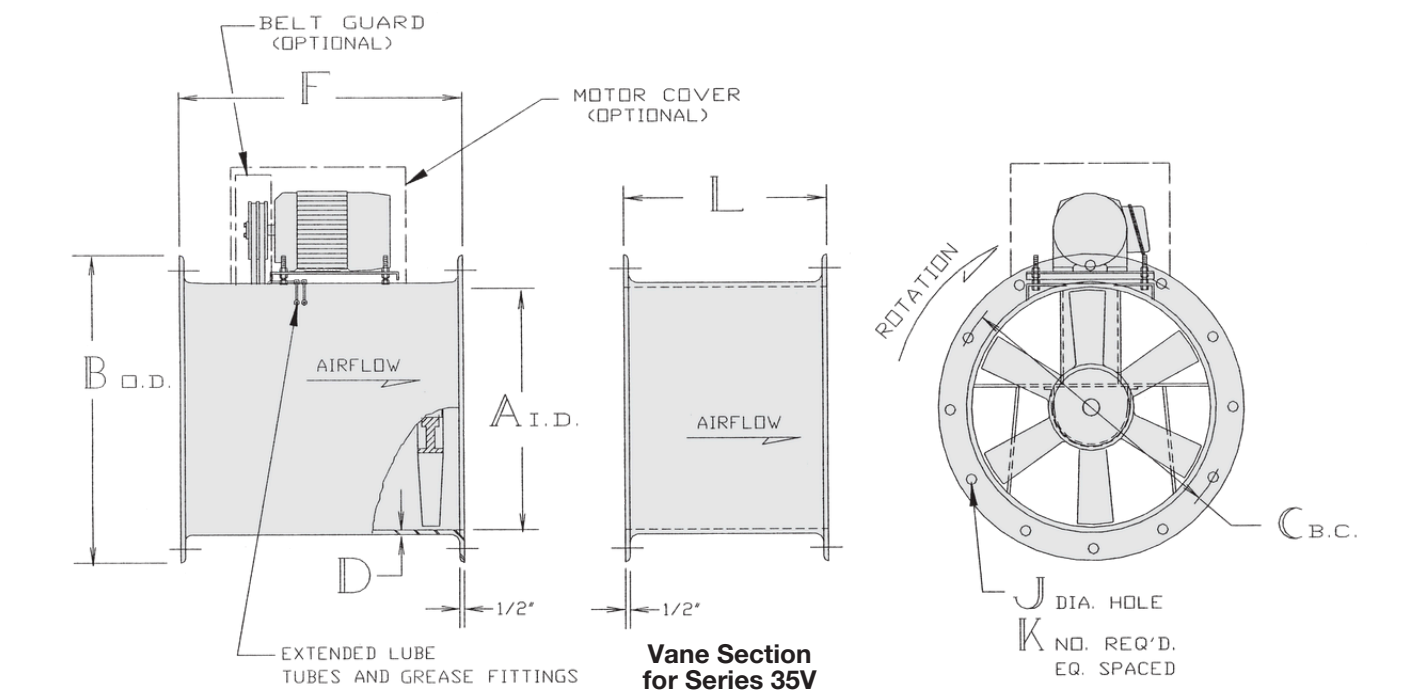
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Series 35V Fiberglass Duct Vaneaxial Fan

Not looking for a fiberglass fan? Hartzell Air Movement manufactures hundreds of different steel, aluminum and stainless steel fans for corrosive environments applications as well. Contact your local sales representative for details!

Dimensions



Principal Dimensions (inches) – Series 35V

| Fan Size | A                              | B                              | C                              | D                            | F  | J                            | K  | L  | Max Motor Frame | *Max Fan Weight |
|----------|--------------------------------|--------------------------------|--------------------------------|------------------------------|----|------------------------------|----|----|-----------------|-----------------|
| 12       | 12 <sup>7</sup> / <sub>8</sub> | 16 <sup>1</sup> / <sub>4</sub> | 14 <sup>1</sup> / <sub>2</sub> | <sup>3</sup> / <sub>16</sub> | 20 | <sup>5</sup> / <sub>16</sub> | 6  | 6  | 145             | 105             |
| 16       | 16 <sup>7</sup> / <sub>8</sub> | 20                             | 18 <sup>1</sup> / <sub>2</sub> | <sup>3</sup> / <sub>16</sub> | 21 | <sup>5</sup> / <sub>16</sub> | 6  | 10 | T               | 120             |
| 18       | 18 <sup>7</sup> / <sub>8</sub> | 22 <sup>1</sup> / <sub>8</sub> | 20 <sup>1</sup> / <sub>2</sub> | <sup>1</sup> / <sub>4</sub>  | 22 | <sup>5</sup> / <sub>16</sub> | 6  | 11 | 145             | 150             |
| 24       | 24 <sup>7</sup> / <sub>8</sub> | 28 <sup>1</sup> / <sub>2</sub> | 26 <sup>3</sup> / <sub>8</sub> | <sup>1</sup> / <sub>4</sub>  | 25 | <sup>7</sup> / <sub>16</sub> | 6  | 13 | T               | 210             |
| 28       | 28 <sup>7</sup> / <sub>8</sub> | 32 <sup>3</sup> / <sub>8</sub> | 30 <sup>5</sup> / <sub>8</sub> | <sup>1</sup> / <sub>4</sub>  | 25 | <sup>7</sup> / <sub>16</sub> | 6  | 13 | 184             | 250             |
| 32       | 33                             | 36 <sup>1</sup> / <sub>2</sub> | 34 <sup>3</sup> / <sub>8</sub> | <sup>1</sup> / <sub>4</sub>  | 28 | <sup>7</sup> / <sub>16</sub> | 6  | 15 | T               | 345             |
| 36       | 37                             | 40 <sup>5</sup> / <sub>8</sub> | 38 <sup>7</sup> / <sub>8</sub> | <sup>1</sup> / <sub>4</sub>  | 28 | <sup>7</sup> / <sub>16</sub> | 6  | 16 | 215             | 405             |
| 44       | 45                             | 48 <sup>1</sup> / <sub>8</sub> | 47 <sup>1</sup> / <sub>8</sub> | <sup>5</sup> / <sub>16</sub> | 36 | <sup>7</sup> / <sub>16</sub> | 12 | 19 | T               | 615             |
| 48       | 49 <sup>1</sup> / <sub>8</sub> | 53 <sup>3</sup> / <sub>8</sub> | 51 <sup>5</sup> / <sub>8</sub> | <sup>5</sup> / <sub>16</sub> | 36 | <sup>7</sup> / <sub>16</sub> | 12 | 22 | 254             | 735             |
| 54       | 55 <sup>3</sup> / <sub>8</sub> | 59 <sup>5</sup> / <sub>8</sub> | 57 <sup>5</sup> / <sub>8</sub> | <sup>5</sup> / <sub>16</sub> | 40 | <sup>7</sup> / <sub>16</sub> | 12 | 23 | T               | 995             |
| 60       | 61 <sup>5</sup> / <sub>8</sub> | 65 <sup>5</sup> / <sub>8</sub> | 63 <sup>5</sup> / <sub>8</sub> | <sup>5</sup> / <sub>16</sub> | 40 | <sup>7</sup> / <sub>16</sub> | 12 | 25 | 254             | 1120            |

\*Weight without motor and accessories.

Performance Guaranteed



Your products are only as good as the components that go into them. We know you have high expectations, and so does Hartzell Air Movement. We know you expect the most reliable and durable industrial air movement products available, so we’re holding ourselves to a higher standard. We’re so sure that our products will out-perform industry standards, we’re backing that promise with the industry’s first – and only – five-year warranty.

At Hartzell, these are words we live by. They guide us every day. Good enough isn’t how you design your products. It’s not how we engineer, build and support our products — or provide ongoing service to our customers. When we looked at the industry standard two-year warranty, we knew we had to do better. And we did — by offering the Hartzell **FIVE-YEAR WARRANTY**.

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.

|                                  |          |               |               |              |       |          | FIBERGLASS***      | COATINGS      |                        |                        |                          |
|----------------------------------|----------|---------------|---------------|--------------|-------|----------|--------------------|---------------|------------------------|------------------------|--------------------------|
|                                  | Aluminum | Stainless 304 | Stainless 316 | Carbon Steel | Monel | Neoprene | Derakane 510-A & B | Epoxy (250°F) | Inorganic Zinc (150°F) | Coal Tar Epoxy (300°F) | Plasite 7122L (HAR, TFE) |
| Acetic Acid, to 10% (Fumes Only) | G        | G             | G             | F            | F     | G        | 210                | G             | NR                     | G                      | F                        |
| Acetone (Fumes Only)             | G        | G             | G             | G            | G     | F        | 180                | G             | G                      | -                      | F                        |
| Alcohol - Ethyl (15%)            | G        | G             | G             | G            | F     | G        | 80                 | G             | G                      | -                      | F                        |
| Aluminum Acetate                 | F        | G             | G             | -            | F     | F        | -                  | G             | NR                     | -                      | F                        |
| Aluminum Hydroxide               | G        | G             | G             | G            | NR    | G        | 180                | G             | NR                     | -                      | F                        |
| Aluminum Sulphate                | G        | F             | G             | G            | F     | G        | 210                | G             | NR                     | -                      | G                        |
| Ammonia (Dry - 1%)               | G        | G             | G             | G            | NR    | G        | 100                | G             | NR                     | G                      | G                        |
| Ammonia (Moist - 1%)             | F        | G             | G             | G            | NR    | G        | NR                 | G             | NR                     | -                      | F                        |
| Ammonium Chloride                | NR       | F             | F             | NR           | F     | G        | *210               | G             | NR                     | G                      | G                        |
| Ammonium Hydroxide to 5%         | F        | G             | G             | F            | NR    | G        | 180S               | G             | NR                     | G(10)                  | F                        |
| Ammonium Nitrate                 | G        | G             | G             | NR           | NR    | F        | 220                | G             | NR                     | G(30)                  | G                        |
| Ammonium Perchlorate             | G        | G             | G             | -            | -     | -        | -                  | NR            | -                      | -                      | G                        |
| Ammonium Persulfate              | F        | G             | G             | G            | NR    | G        | 180                | NR            | -                      | -                      | G                        |
| (Saturated)                      | G        | G             | G             | NR           | F     | G        | 210                | G             | -                      | -                      | G                        |
| Ammonium Phosphate               | NR       | G             | G             | F            | F     | G        | 220                | F             | -                      | G(10)                  | G                        |
| Ammonium Sulphate                | NR       | G             | G             | -            | NR    | -        | 150                | G             | -                      | -                      | G                        |
| Ammonium Sulphite                | NR       | G             | G             | F            | F     | G        | 210                | G             | -                      | -                      | G                        |
| Barium Chloride                  | NR       | -             | G             | F            | -     | G        | 150                | G             | NR                     | -                      | G                        |
| Barium Hydroxide                 | G        | G             | G             | G            | NR    | G        | -                  | F             | -                      | -                      | G                        |
| Barium Nitrate                   | G        | G             | G             | G            | F     | G        | 210                | F             | -                      | -                      | G                        |
| Barium Sulphate                  | G        | G             | G             | F            | G     | NR       | NR                 | G             | -                      | -                      | G                        |
| Benzene                          | G        | G             | G             | -            | F     | NR       | 210                | G             | G                      | -                      | G                        |
| Benzoic Acid                     | G        | G             | G             | F            | F     | G        | 210                | G             | NR                     | -                      | G                        |
| Boric Acid (5%)                  | NR       | NR            | NR            | NR           | NR    | F        | NR                 | G             | NR                     | G                      | F                        |
| Bromine, Wet Gas                 | G        | G             | G             | -            | F     | NR       | 210                | NR            | -                      | -                      | G                        |
| Butyric Acid, to 50%             | F        | G             | G             | G            | F     | G        | 100S               | G             | -                      | -                      | G                        |
| Calcium Carbonate                | -        | G             | G             | -            | F     | G        | 220                | G             | -                      | -                      | F                        |
| Calcium Chlorate                 | F        | F             | F             | F            | F     | G        | 220                | G             | NR                     | -                      | G                        |
| Calcium Chloride                 | F        | G             | G             | F            | F     | G        | 180SS              | G             | NR                     | -                      | F                        |
| Calcium Hydroxide                | G        | G             | G             | NR           | F     | NR       | NR                 | NR            | -                      | G(5)                   | NR                       |
| Carbolic Acid                    | G        | G             | G             | -            | NR    | G        | 250                | G             | -                      | -                      | G                        |
| Carbon Monoxide Gas              | G        | G             | G             | NR           | G     | NR       | 150                | G             | F                      | G                      | G                        |
| Carbon Tetrachloride             | F        | F             | F             | NR           | G     | F        | *220SS             | F             | NR                     | -                      | F                        |
| Chlorine Gas (Dry)               | NR       | NR            | NR            | NR           | NR    | NR       | *180SS             | F             | NR                     | -                      | NR                       |
| Chlorine Gas (Moist)             | NR       | -             | -             | NR           | NR    | NR       | *180SS             | G             | NR                     | G                      | F                        |
| Chlorine Water                   | G        | G             | G             | F            | G     | NR       | NR                 | F             | F                      | -                      | F                        |
| Chlorobenzene                    | F        | F             | G             | NR           | NR    | NR       | 150                | G(20)         | NR                     | NR                     | F                        |
| Chromic Acid, to 5%              | F        | G             | G             | NR           | F     | G        | *210               | G             | NR                     | G                      | F                        |
| Citric Acid                      | NR       | G             | G             | NR           | NR    | F        | -                  | G             | -                      | -                      | F                        |
| Copper Acetate                   | NR       | NR            | NR            | NR           | NR    | G        | *210               | G             | -                      | -                      | G                        |
| Copper Chloride                  | NR       | G             | G             | NR           | NR    | G        | 210                | G             | -                      | -                      | F                        |
| Copper Cyanide                   | NR       | G             | G             | NR           | NR    | G        | 210                | F             | -                      | -                      | F                        |
| Copper Nitrate                   | NR       | G             | G             | NR           | NR    | G        | 210                | F             | -                      | -                      | G                        |
| Copper Sulphate                  | G        | F             | F             | G            | -     | F        | 150                | G             | -                      | G                      | G                        |
| Detergents                       | F        | G             | G             | NR           | F     | NR       | NR                 | G             | F                      | -                      | NR                       |
| Ethyl Chloride                   | F        | G             | G             | NR           | -     | NR       | NR                 | G             | F                      | -                      | NR                       |
| Ethylene Chloride                | NR       | G             | G             | -            | NR    | G        | 210                | F             | -                      | -                      | -                        |
| Ferric Nitrate                   | NR       | F             | F             | NR           | F     | G        | 210                | F             | -                      | -                      | -                        |
| Ferric Sulphate                  | G        | F             | G             | NR           | F     | G        | 210                | F             | -                      | -                      | G                        |
| Ferrous Sulphate                 | NR       | NR            | F             | NR           | -     | G        | 210SS              | NR            | -                      | -                      | F                        |
| Fluoboric Acid                   | G        | G             | G             | G            | G     | NR       | 150                | G(20)         | NR                     | G                      | F                        |
| Formalin Formaldehyde            | F        | G             | G             | NR           | F     | G        | 180                | NR            | NR                     | -                      | F                        |
| Formic Acid, to 10%              | G        | G             | G             | G            | F     | F        | NR                 | F             | NR                     | -                      | F                        |
| Furfural, to 10%                 | G        | G             | G             | NR           | F     | F        | -                  | F             | -                      | -                      | -                        |
| Gallie Acid                      | G        | G             | G             | G            | G     | F        | 120                | G             | G                      | G                      | G                        |
| Gasoline                         | NR       | NR            | NR            | NR           | NR    | NR       | *180               | NR            | NR                     | -                      | -                        |
| Hydrobromic Acid, to 25%         | NR       | NR            | NR            | NR           | F     | G        | *210SS             | NR            | NR                     | G                      | F                        |
| Hydrochloric Acid, to 15%        | NR       | NR            | NR            | NR           | -     | -        | 100                | NR            | -                      | -                      | -                        |
| Hypochlorous Acid                | G        | G             | G             | F            | -     | G        | 210                | NR            | -                      | -                      | F                        |
| Hydrocyanic Acid, to 10%         | NR       | NR            | NR            | -            | F     | F        | *100SS             | NR            | -                      | -                      | G                        |
| Hydrofluosilicic Acid, to 10%    | NR       | NR            | NR            | NR           | G     | G        | *150SS             | NR            | NR                     | -                      | NR                       |
| Hydrofluoric Acid, to 30%        | G        | G             | G             | NR           | F     | F        | 150                | G             | NR                     | G                      | F                        |
| Hydrogen Peroxide, to 10%        | G        | F             | G             | G            | NR    | G        | 180                | F             | NR                     | G                      | F                        |
| Hydrogen Sulfide, to 5%          | F        | F             | G             | NR           | NR    | G        | *210               | NR            | NR                     | -                      | G                        |
| Lactic Acid                      | F        | G             | G             | -            | F     | G        | 180                | G             | -                      | -                      | -                        |
| Magnesium Carbonate              | NR       | F             | G             | F            | G     | G        | 210                | G             | NR                     | -                      | G                        |
| Magnesium Chloride               | G        | G             | G             | -            | F     | G        | 210                | F             | -                      | -                      | -                        |
| Magnesium Nitrate                | NR       | NR            | NR            | -            | -     | -        | -                  | NR            | -                      | -                      | -                        |
| Magnesium Oxychloride            | G        | G             | G             | G            | F     | NR       | 210                | NR            | -                      | -                      | G                        |
| Maleic Acid                      | F        | G             | G             | -            | F     | -        | -                  | G             | -                      | -                      | -                        |
| Manganese Carbonate              | NR       | G             | G             | -            | NR    | -        | -                  | F             | -                      | -                      | F                        |
| Mercurous Nitrate                |          |               |               |              |       |          |                    |               |                        |                        |                          |
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NOTES: \* Special shaft and hardware required, contact factory.  
\*\* Special design considerations required (explosive environment), contact factory.  
\*\*\* Temperature values shown for fiberglass resins are for immersion or condensate contact applications.

|                             |          |               |               |              |       |          | FIBERGLASS***      | COATINGS      |                        |                        |                          |
|-----------------------------|----------|---------------|---------------|--------------|-------|----------|--------------------|---------------|------------------------|------------------------|--------------------------|
|                             | Aluminum | Stainless 304 | Stainless 316 | Carbon Steel | Monel | Neoprene | Derakane 510-A & B | Epoxy (250°F) | Inorganic Zinc (150°F) | Coal Tar Epoxy (300°F) | Plasite 7122L (HAR, TFE) |
| Methyl Ethyl Ketone, to 10% | G        | G             | G             | G            | -     | NR       | NR                 | G             | G                      | F                      | F                        |
| Methylene Chloride          | NR       | G             | G             | G            | F     | NR       | NR                 | NR            | F                      | -                      | F                        |
| Naphtha                     | G        | G             | G             | G            | F     | NR       | 180                | G             | G                      | G                      | G                        |
| Naphthalensulfonic Acid     | NR       | NR            | NR            | -            | -     | NR       | -                  | NR            | -                      | -                      | G                        |
| Nickel Chloride             | NR       | F             | F             | NR           | F     | F        | 210                | G             | -                      | -                      | G                        |
| Nickel Nitrate              | NR       | G             | G             | NR           | NR    | -        | 210                | F             | -                      | -                      | -                        |
| Nickel Sulphate             | NR       | F             | F             | NR           | F     | G        | 210                | F             | -                      | -                      | -                        |
| Nitric Acid, to 5%          | NR       | G             | G             | NR           | NR    | F        | 150                | NR            | NR                     | F                      | F                        |
| Nitrous Acid                | F        | G             | G             | -            | NR    | NR       | -                  | NR            | -                      | -                      | F                        |
| Oleic Acid                  | G        | G             | G             | F            | G     | F        | 210                | G             | NR                     | -                      | G                        |
| Oxalic Acid, to 10%         | NR       | G             | G             | NR           | F     | F        | *120               | G             | NR                     | G(20)                  | G                        |
| Ozone                       |          |               |               |              |       |          | NR                 |               |                        |                        |                          |
| Perchloric Acid, to 10%**   | NR       | NR            | NR            | NR           | G     | F        | 150                | NR            | NR                     | -                      | NR                       |
| Phenol, to 10%              | NR       | NR            | NR            | NR           | F     | -        | NR                 | NR            | NR                     | -                      | F                        |
| Phosphoric Acid, to 10%     | G        | G             | G             | NR           | F     | F        | *210               | G(10)         | F                      | -                      | F                        |
| Phosphoric Anhydride        | NR       | G             | G             | NR           | -     | F        | -                  | NR            | NR                     | NR                     | -                        |
| Picric Acid, to 10%         | G        | G             | G             | -            | NR    | G        | NR                 | F             | -                      | -                      | F                        |
| Potassium Bromide           | G        | G             | G             | NR           | F     | G        | -                  | NR            | -                      | -                      | G                        |
| Potassium Chloride          | F        | G             | G             | NR           | F     | G        | 210                | G             | -                      | -                      | G                        |
| Potassium Cyanide           | F        | C             | C             | C            | F     | G        | -                  | G             | -                      | -                      | G                        |
| Potassium Dichromate        | NR       | G             | G             | G            | F     | G        | 210                | F             | NR                     | -                      | -                        |
| Potassium Ferricyanide      | G        | G             | G             | F            | F     | G        | 210                | G             | -                      | -                      | G                        |
| Potassium Ferrocyanide      | G        | G             | G             | -            | F     | G        | 210                | G             | -                      | -                      | G                        |
| Potassium Hydroxide, to 25% | G        | G             | G             | F            | G     | G        | 150SS              | G             | -                      | -                      | G                        |
| Potassium Hypochlorite      | NR       | G             | G             | G            | NR    | -        | -                  | G             | NR                     | G                      | -                        |
| Potassium Nitrate           | NR       | NR            | NR            | -            | F     | G        | 210                | G             | -                      | -                      | G                        |
| Potassium Permanganate      | G        | G             | G             | G            | F     | -        | 210                | G             | -                      | -                      | G                        |
| Potassium Sulphate          | G        | G             | G             | G            | G     | G        | 210                | F             | -                      | G(5)                   | F                        |
| Pyrogallie Acid             | F        | G             | G             | G            | G     | F        | -                  | G             | -                      | -                      | -                        |
| Salt Spray                  | G        | G             | G             | G            | G     | G        | 210                | F             | -                      | -                      | G                        |
| Silver Bromide              | F        | G             | G             | NR           | F     | -        | -                  | G             | G                      | G                      | -                        |
| Silver Nitrate              | NR       | F             | G             | -            | NR    | G        | 210                | G             | -                      | -                      | F                        |
| Sodium Acetate              | NR       | G             | G             | NR           | G     | F        | 210                | G             | -                      | -                      | -                        |
| Sodium Bisulfate            | G        | G             | G             | F            | F     | F        | 210                | G             | NR                     | -                      | G                        |
| Sodium Borate               | F        | G             | G             | NR           | F     | F        | 210                | G             | -                      | -                      | -                        |
| Sodium Carbonate, to 35%    | F        | G             | G             | F            | G     | G        | 180SS              | G             | NR                     | -                      | G                        |
| Sodium Chlorate             | NR       | G             | G             | G            | G     | G        | 210                | G             | NR                     | -                      | G                        |
| Sodium Chloride             | F        | G             | G             | F            | G     | G        | 180                | NR            | NR                     | -                      | G                        |
| Sodium Citrate              | F        | F             | G             | F            | -     | -        | -                  | G(30)         | NR                     | G                      | G                        |
| Sodium Dichromate           | NR       | G             | G             | -            | -     | F        | 210                | F             | -                      | -                      | -                        |
| Sodium Ferricyanide         | G        | -             | -             | G            | F     | -        | 210                | F             | NR                     | -                      | -                        |
| Sodium Fluoride             | G        | G             | G             | -            | G     | NR       | 180SS              | G             | -                      | -                      | -                        |
| Sodium Hydroxide, to 10%    | F        | G             | G             | NR           | G     | G        | 150SS              | F             | -                      | -                      | F                        |
| Sodium Hypochlorite, to 15% | NR       | G             | G             | G            | NR    | G        | 150SS              | G             | NR                     | G                      | F                        |
| Sodium Hyposulfite          | NR       | F             | F             | NR           | F     | -        | -                  | F             | NR                     | G(5)                   | -                        |
| Sodium Nitrate              | NR       | G             | G             | -            | F     | F        | 210                | F             | -                      | -                      | G                        |
| Sodium Nitrite              | G        | G             | G             | G            | F     | -        | -                  | F             | -                      | -                      | G                        |
| Sodium Perchlorate, to 10%  | G        | G             | G             | -            | -     | -        | -                  | F             | -                      | -                      | -                        |
| Sodium Peroxide             | G        | G             | G             | -            | F     | G        | -                  | NR            | -                      | -                      | -                        |
| Sodium Phosphate            | F        | G             | G             | F            | G     | F        | 210                | F             | -                      | -                      | F                        |
| Sodium Salicylate           | NR       | G             | G             | -            | -     | -        | -                  | G             | -                      | G(10)                  | F                        |
| Sodium Silicate             | NR       | -             | G             | -            | F     | G        | -                  | G             | -                      | -                      | G                        |
| Sodium Sulfate              | F        | G             | G             | G            | G     | G        | 210                | G             | NR                     | -                      | F                        |
| Sodium Sulfite              | F        | G             | G             | G            | F     | G        | 210                | F             | NR                     | -                      | G                        |
| Sodium Sulfide              | F        | G             | G             | -            | F     | G        | 210                | F             | NR                     | -                      | G                        |
| Stannic Chloride            | NR       | G             | G             | G            | NR    | F        | *210               | G             | NR                     | -                      | -                        |
| Stannous Chloride           | NR       | NR            | NR            | NR           | NR    | G        | *210               | NR            | -                      | -                      | G                        |
| Steam Vapor                 | NR       | F             | F             | NR           | G     | G        | 180                | F             | -                      | -                      | NR                       |
| Stearic Acid                | G        | G             | G             | G            | F     | F        | 210                | F             | -                      | -                      | G                        |
| Strontium Hydroxide         | G        | G             | G             | F            | -     | -        | -                  | G             | NR                     | -                      | -                        |
| Strontium Nitrate           | NR       | G             | G             | -            | G     | -        | -                  | G             | -                      | -                      | -                        |
| Sulfur Dioxide Gas          | NR       | G             | G             | -            | NR    | G        | 210                | F             | -                      | -                      | G                        |
| Sulfuric Acid, to 25%       | G        | G             | G             | G            | F     | G        | *210S              | NR            | NR                     | -                      | F                        |
| Sulfurous Acid, to 40%      | NR       | NR            | NR            | NR           | NR    | NR       | 120                | NR            | NR                     | G                      | F                        |
| Tannic Acid                 | F        | F             | F             | NR           | F     | G        | 210                | NR            | NR                     | -                      | G                        |
| Tartaric Acid               | F        | G             | G             | F            | F     | G        | 210                | G(50)         | NR                     | G                      | F                        |
|                             | F        | G             | G             | NR           | G     | NR       | NR                 | G             | NR                     | -                      | F                        |
|                             | F        | G             | G             | G            | G     | G        | 200                | NR            | F                      | -                      | G                        |
|                             | G        | G             | G             | NR           | -     | NR       | 80                 | G             | G                      | G                      | G                        |
|                             | G        | G             | G             | G            | F     | G        | *210               | G             | G                      | G                      | G                        |
| Trichlorethylene            | NR       | G             | G             | NR           | -     | -        | 180SS              | G             | -                      | -                      | -                        |
| Water (Moisture)            | NR       | C             | C             | -            | -     | -        | 210                | G             | -                      | -                      | -                        |
| Xylo1-Toluo1                | F        | G             | G             | -            | F     | G        | 210                | F             | -                      | -                      | -                        |
| Zinc Chloride               | F        | G             | G             | NR           |       |          |                    | F             |                        |                        |                          |
| Zinc Cyanide (Molst)        |          |               |               |              |       |          |                    |               |                        |                        |                          |
| Zinc Nitrate                |          |               |               |              |       |          |                    |               |                        |                        |                          |
| Zinc Sulfate                |          |               |               |              |       |          |                    |               |                        |                        |                          |



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