

# Fiberglass Air Control Products

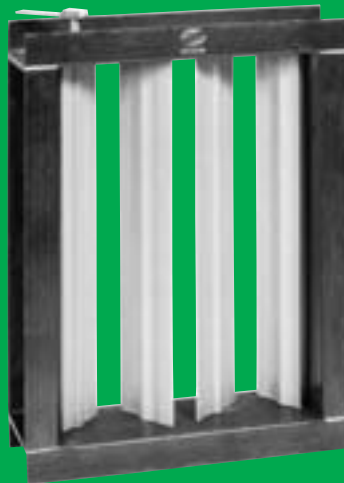
Series FFL

Series FEP

Series FLC

Series FCO

Series FCP



# HARTZELL®

Hartzell Fan, Inc., Piqua, Ohio 45356  
[www.hartzellfan.com](http://www.hartzellfan.com)

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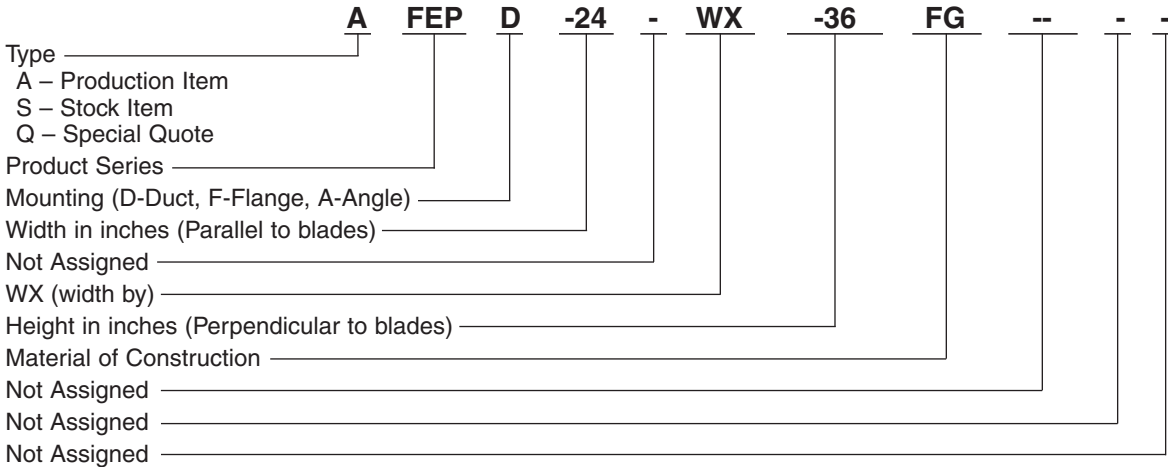
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## Ratings for Air Performance and Leakage

Hartzell Fan, Inc. certifies that the Series FFL - Fiberglass Fixed Blade Drainable Louver, Series FEP - Fiberglass End-Pivoted Automatic Shutter, Series FLC - Fiberglass Low Velocity, Center-Pivoted Damper, Series FCO and FCP - Fiberglass Volume Control Dampers air performance and leakage ratings shown herein are reliable and accurate and in accordance with industry standards. The ratings shown are based on tests and procedures performed in accordance with AMCA Standard 500.

## Hartzell Model Code Explanation



### Example:

Assume a needed Fiberglass Automatic Shutter for 6,000 CFM. for a duct size of 24" wide x 36" high. The shutter area will be 6 Sq. Ft. and the face velocity will be 1,000 FPM. Reading the performance curve on page 6 we find the pressure loss through the shutter at 0.27" static pressure.

The model code can be constructed as follows: Type will be a production item (code A), product series for the Fiberglass End Pivoted

Automatic Shutter is FEP, duct mounting will be used (code D), Width is 24, Height is 36, material of construction is fiberglass (Code FG).

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

## Construction Options and Accessories

**Abrasive/Erosive Resistant Coating** HartKoate is an abrasive/erosive and impact resistant coating for application in environments where abrasive/erosive conditions may exist. HartKoate is particularly appropriate for use when water mist and/or abrasive particles exist in the airstream. HartKoate helps prevent premature deterioration of equipment in environments where uncoated components may fail. Max. temp. 200°F.

**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.

**Electrostatically Grounded Fiberglass** - For applications in which fiberglass control 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 and grounding straps secured from the side of the frame. All that remains to effectively ground the part is to ground the frame at the time of installation.

**Inlet Control Damper** – Round Dampers are available for 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.



**Guards** - Inlet and outlet guards are available for fiberglass dampers and louvers. OSHA style. Stainless steel construction, epoxy coated steel, or fiberglass.

**Manual Operators and Locking Quadrants** – Available mounted to control dampers.

**Motor Operators and Actuators** – Available in electric or pneumatic with options per customer specifications.

**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 guarded to be in accordance with OSHA regulations.

This bulletin lists Hartzell's line of Fiberglass Air Control Products 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](http://www.hartzellfan.com)) or call toll-free 1 (800) 336-3267 for the name of your Hartzell representative.



# 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.	6694 Reichold F.	510A Dow F.	Environment	Hetron 693 Ashland F.	6694 Reichold F.	510A Dow F.	Environment	Hetron 693 Ashland F.	6694 Reichold F.	510A Dow F.
<b>ACIDS</b>				<b>ALKALIES (Synthetic Veil)</b>				<b>SALTS (cont'd.)</b>			
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	<b>SOLVENTS</b>			
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	<b>SALTS</b>				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
Hydrofluosilicic 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	<b>BLEACHES</b>			
Perchloric to 10%	H&D	**150	**150	Calcium Chlorate	180	220	220	Calcium Chlorate	180	220	220
Phosphoric	*220	*\$210	*\$210	Calcium Chloride	250	240	220	Calcium Hypochlorite	100	NR	\$160
Phosphoric, super	-	*\$210	*\$210	Calcium Sulfate	*200	*240	*210	Chlorine Dioxide up to 15%	-	160	*200
Phthalic Anhydride	*150	*210	*210	Copper Chloride	*250	*220	*220	Chlorine Water	*125	*210	*200
Picric to 10%	100	170	NR	Copper Cyanide	90	\$220	210	Hydrogen Peroxide to 30%	120	100	150
Silicic	-	220	NR	Copper Fluoride	NR	\$170	NR	Sodium Chlorate	90	210	210
Stearic	200	220	210	Copper Sulfate	250	240	210	Sodium Hypochlorite to 15%	NR	125	\$180
Sulfamic to 25%	160	150	NR	Ferric Chloride	*250	*220	*210	<b>OTHERS</b>			
Sulfuric to 25%	*200	*220	*210	Ferric Nitrate	170	220	210	Alum. Chlorohydroxide to 50%	-	220	210
Sulfuric to 50%	*200	*200	*180	Ferric Sulfate	200	220	210	Ammonium Phosphate	150	210	210
Sulfuric to 70%	*150	*180	*100	Ferrous Chloride	*220	*220	*210	Aqua Rega	NR	*80	NR
Sulfuric to 80%	NR	80	NR	Ferrous Nitrate	160	220	210	Detergents	120	170	150
Sulfurous to 10%	90	110	120	Ferrous Sulfate	220	220	210	Glycerine	200	220	210
Tannic	200	220	210	Lead Acetate	160	220	210	Kerosene	120	210	180
Tartaric	220	220	210	Magnesium Chloride	220	240	210	Photographic Solutions	-	80	NR
Trichloroacetic to 50%	*90	*220	*200	Magnesium Hydroxide	-	\$210	210	Perchloroethylene	NR	100	80
<b>ALCOHOLS</b>				Magnesium Sulfate	200	210	210	Sodium Tetraborate	180	\$210	180
Amyl	200	210	120	Mercuric Chloride	*210	*220	*210	Sodium Tripolyphosphate	125	210	210
Benzyl	NR	100	NR	Mercurous Chloride	210	220	210	Sodium Xylene Sulfonate	-	170	160
Butyl	190	150	120	Nickel Chloride	220	220	210	Sorbitol Solutions	180	220	160
Ethyl	90	120	80	Nickel Nitrate	220	220	210	Urea	90	170	150
Methyl	90	80	NR	Nickel Sulfate	220	220	210	Urea-Ammonium-Nitrate	-	120	120
<b>GASES AND VAPORS</b>				Potassium Chloride	200	240	210	Fertilizer Fumes	100	120	150
Ammonia, Dry	90	170	100	Potassium Dichromate	200	220	210	Shell-D-D	NR	100	NR
Ammonia, Wet	90	NR	NR	Potassium Ferricyanide	200	220	210	Steam Vapor	180	210	180
Bromine, Wet	90	*100	NR	Potassium Nitrate	200	220	210				
Carbon Dioxide	250	250	250	Potassium Permanganate	150	210	210				
Carbon Monoxide	200	250	250	Potassium Persulfate	90	220	210				
Chlorine, Dry	*200	*210	NR	Potassium Sulfate	200	240	210				
Fluorine	-	NR	80	Silver Nitrate	200	220	210				
Hydrogen Fluoride, Vapor	*90	*\$180	*\$180	Sodium Acetate	150	220	210				
Hydrogen Sulfide to 5%	250	240	180	Sodium Bisulfate	200	220	210				
Sulfur Dioxide, Dry	200	250	210	Sodium Chloride	200	240	180				
Sulfur Dioxide, Wet	200	250	210	Sodium Chlorite to 10%	175	170	150				
Sulfur Trioxide, Wet	-	220	210	Sodium Cyanide	100	220	210				
				Sodium Dichromate	160	220	210				

Reference  
C.R.G.1.1

**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.

## 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 also 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.



# Series FFL, Fiberglass Fixed Blade Drainable Louver



## Series FFL

Fiberglass Fixed Blade Drainable Louver



Hartzell Fan, Inc. certifies that the Series FFL - Fiberglass Fixed Blade Drainable Louver, air performance ratings shown herein are reliable and accurate and in accordance with industry standards. The ratings shown are based on tests and procedures performed in accordance with AMCA Standard 500.

**Applications** - The Hartzell Series FFL are fixed blade drainable louvers constructed entirely of fiberglass. It is recommended for air intake, exhaust, or pressure relief. This fiberglass shutter is best suited for applications where corrosive elements exist in fume or vapor form. Maximum temperature is 200°F.

- Maximum Recommended Free Area Inlet Velocity – 825 FPM.
- Maximum Louver Size – 72" wide x 72" high. Larger size units are available in multiple panel construction with special reinforced manufacturing techniques.
- Minimum panel size is 12" wide x 12" high.

## Construction Features:

All parts of this product are fiberglass and Isophthalic polyester resin. Joints are bonded with an industrial grade epoxy adhesive, having similar corrosion resistant properties as a polyester resin. The resin has a Class I flame spread rate of 25 or less. All surfaces are protected to be ultra-violet resistant.

Solid fiberglass reinforced plastic shapes and pultrusions utilize woven fiberglass mat material for superior strength. The dimensional stability of fiberglass is excellent. Fiberglass will not become brittle at low temperatures, and at 0°F the laminated fiberglass will be stronger than at room temperature. Fiberglass reinforced plastic has a strength to weight ratio 43% greater than that of aluminum.

**Frame** – 4" x 11/16" x 1/8" fiberglass reinforced polyester.

**Blades** – Minimum .070" thick fiberglass reinforced polyester.

**Draining** – Blades drain to either side with runoff discharged at bottom of louver.

**Standard Color** – Medium gray. Other colors available upon request.

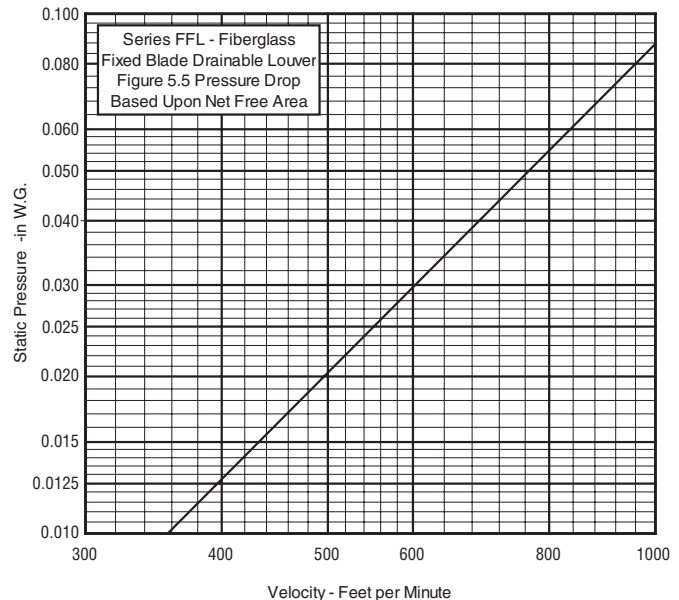
**Mounting Configurations** – Flanged frame for narrow walls reference drawing no. D742. Full perimeter angle for deep walls reference drawing no. D743, (check local building codes).

**Corrosive Resistant Guide** – Please refer to Corrosion Resistance Guide on Page 3 for topcoat resin application for additional corrosion resistance.

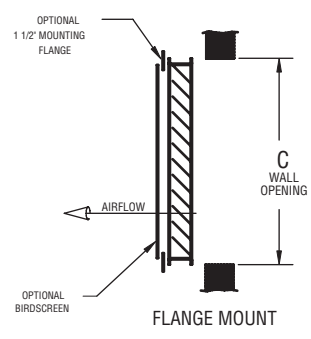
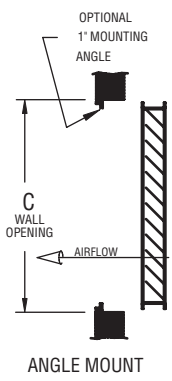
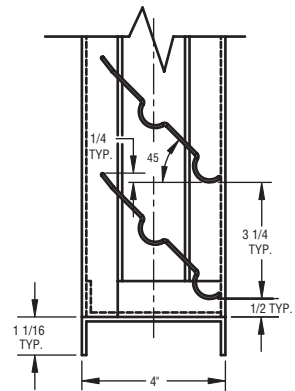
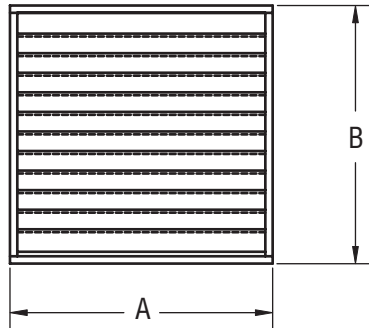
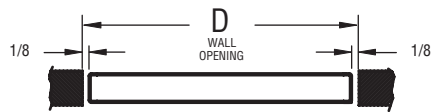
## Options and Accessories

- Insect screen
- Fiberglass bird screen
- Fiberglass mounting angle
- HartKoate, Hi-Cor, or electrostatically grounded construction.
- For construction options and other accessories please refer to page 2.

## Performance Data



# Dimensions – Series FFL Fiberglass Fixed Blade Drainable Louver



FAN SIZE	A	B	C	D
12	12	12	12 1/4	12 1/4
14	14	14	14 1/4	14 1/4
16	16	16	16 1/4	16 1/4
18	18	18	18 1/4	18 1/4
20	20	20	20 1/4	20 1/4
22	22	22	22 1/4	22 1/4
24	24	24	24 1/4	24 1/4
26	26	26	26 1/4	26 1/4
28	28	28	28 1/4	28 1/4
30	30	30	30 1/4	30 1/4
32	32	32	32 1/4	32 1/4
36	36	36	36 1/4	36 1/4
40	40	40	40 1/4	40 1/4
42	42	42	42 1/4	42 1/4
44	44	44	44 1/4	44 1/4
48	48	48	48 1/4	48 1/4
54	54	54	54 1/4	54 1/4
60	60	60	60 1/4	60 1/4
72	72	72	72 1/4	72 1/4

## Free Area In Square Feet

		Width																		
		12	14	16	18	20	22	24	26	28	30	32	36	40	42	44	48	54	60	72
Height	12	.40	.48	.56	.65	.73	.81	.89	.97	1.05	1.13	1.21	1.38	1.54	1.62	1.70	1.87	1.96	2.21	2.70
	14	.41	.50	.58	.66	.75	.83	.91	1.0	1.08	1.16	1.25	1.41	1.58	1.66	1.75	1.92	1.99	2.24	2.74
	16	.47	.56	.66	.76	.85	.95	1.04	1.14	1.23	1.33	1.42	1.61	1.80	1.90	1.99	2.18	2.26	2.55	3.12
	18	.54	.65	.76	.86	.97	1.08	1.19	1.30	1.41	1.52	1.63	1.85	2.06	2.17	2.28	2.50	2.59	2.92	3.57
	20	.66	.80	.93	1.07	1.20	1.34	1.47	1.61	1.74	1.87	2.01	2.28	2.55	2.68	2.82	3.09	3.21	3.61	4.42
	22	.72	.87	1.01	1.16	1.31	1.45	1.60	1.74	1.89	2.04	2.18	2.48	2.77	2.91	3.06	3.35	3.51	3.95	4.83
	24	.79	.95	1.11	1.27	1.43	1.59	1.75	1.91	2.07	2.23	2.39	2.71	3.03	3.19	3.35	3.67	3.83	4.31	5.27
	26	.87	1.05	1.23	1.40	1.58	1.76	1.93	2.11	2.29	2.47	2.64	3.0	3.35	3.53	3.7	4.06	4.24	4.78	5.83
	28	.95	1.14	1.34	1.53	1.72	1.91	2.10	2.30	2.49	2.69	2.88	3.26	3.65	3.84	4.03	4.42	4.62	5.19	6.35
	30	1.04	1.25	1.46	1.66	1.89	2.10	2.31	2.52	2.73	2.94	3.15	3.57	4.0	4.21	4.42	4.84	5.06	5.70	6.96
	32	1.15	1.39	1.62	1.86	2.09	2.32	2.56	2.79	3.03	3.26	3.49	3.96	4.43	4.66	4.90	5.36	5.63	6.33	7.73
	36	1.29	1.56	1.82	2.08	2.34	2.60	2.87	3.13	3.39	3.65	3.91	4.44	4.96	5.22	5.49	6.01	6.30	7.08	8.66
	40	1.42	1.71	2.0	2.28	2.57	2.88	3.14	3.43	3.72	4.01	4.30	4.87	5.45	5.73	6.02	6.60	6.90	7.76	9.49
	42	1.48	1.78	2.08	2.37	2.67	2.97	3.27	3.57	3.87	4.17	4.47	5.07	5.67	5.96	6.26	6.86	7.19	8.39	10.18
	44	1.55	1.86	2.17	2.48	2.80	3.11	3.42	3.74	4.05	4.36	4.68	5.30	5.93	6.24	6.55	7.18	7.50	8.44	10.32
	48	1.67	2.01	2.35	2.69	3.03	3.36	3.70	4.04	4.38	4.72	5.06	5.73	6.41	6.75	7.09	7.76	8.10	9.12	11.15
	54	1.92	2.31	2.70	3.09	3.48	3.87	4.26	4.65	5.04	5.43	5.82	6.60	7.38	7.77	8.16	8.94	9.31	10.50	12.84
	60	2.18	2.62	3.06	3.50	3.94	4.39	4.82	5.26	5.70	6.14	6.58	7.46	8.34	8.78	9.22	10.11	10.57	11.86	14.54
	72	2.67	3.21	3.75	4.29	4.83	5.37	5.91	6.46	7.0	7.54	8.08	9.16	10.24	10.78	11.32	12.40	13.0	14.62	17.86

Note: Maximum blade length is 72". Larger size units are available in multiple panel construction with special reinforced manufacturing techniques. Dimensions and specifications are subject to change. Certified prints are available.



# Series FEP, Fiberglass End-Pivoted Automatic Shutter



**Series FEP**  
Fiberglass End Pivoted  
Automatic Shutter



Hartzell Fan, Inc. certifies that the Series FEP - Fiberglass End-Pivoted Automatic Shutter, air performance ratings shown herein are reliable and accurate and in accordance with industry standards. The ratings shown are based on tests and procedures performed in accordance with AMCA Standard 500.

**Applications** - The Hartzell Series FEP are end-pivoted, gravity, backdraft shutters constructed entirely of fiberglass. It is recommended for gravity backdraft prevention applications, used in conjunction with low pressure, low velocity fans such as propeller fans and utility sets. This fiberglass shutter is best suited for applications where corrosive elements exist in fume or vapor form.

- Maximum temperature is 200°F.
- Maximum Face Velocity – 2,500 FPM.
- Maximum Differential Pressure – 1" W.G.
- Maximum Panel Size – 48" wide x 48" high. Larger size units are available in multiple panel construction with special reinforced manufacturing techniques.
- Minimum panel size is 12" wide x 12" high.

## Construction Features:

All parts of this product are fiberglass and Isophthalic polyester resin. Joints are bonded with an industrial grade epoxy adhesive, having similar corrosion resistant properties as a polyester resin. The resin has a Class I flame spread rate of 25 or less. All surfaces are protected to be ultra-violet resistant.

Solid fiberglass reinforced plastic shapes and pultrusions utilize woven fiberglass mat material for superior strength. The dimensional stability of fiberglass is excellent. Fiberglass will not become brittle at low temperatures, and at 0°F the laminated fiberglass will be stronger than at room temperature. Fiberglass reinforced plastic has a strength to weight ratio 43% greater than that of aluminum.

- Frame** – 4" x 11/16" x 1/8" fiberglass reinforced polyester.
- Blades** – Minimum .070" thick fiberglass reinforced polyester.
- Stops** – 1/8" fiberglass reinforced polyester angle.
- Axles** – 3/4" diameter fiberglass reinforced polyester rod.
- Bearings** – Fiber reinforced thermoplastic.
- Standard Color** – Medium gray. Other colors available upon request.

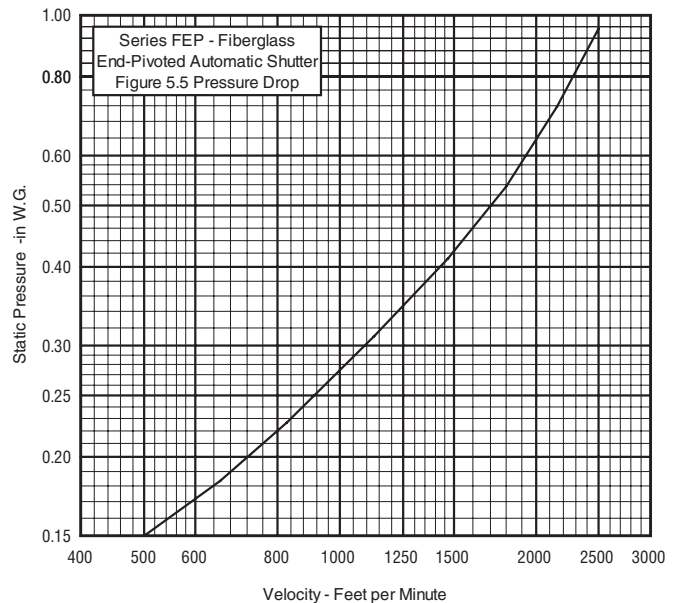
**Mounting Configurations** – Flange Mount reference drawing no. D722. Duct Mount reference drawing no. D723.

**Corrosive Resistant Guide** – Please refer to Corrosion Resistance Guide on Page 3 for topcoat resin application for additional corrosion resistance.

## Options and Accessories

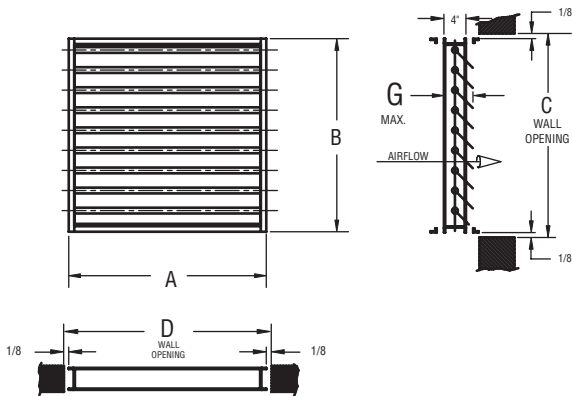
- Insect screen
- Blade seals
- Fiberglass mounting angle
- For construction options and other accessories please refer to page 2. Not available with HartKoate, Hi-Cor, or electrostatically grounded construction.

## Performance Data



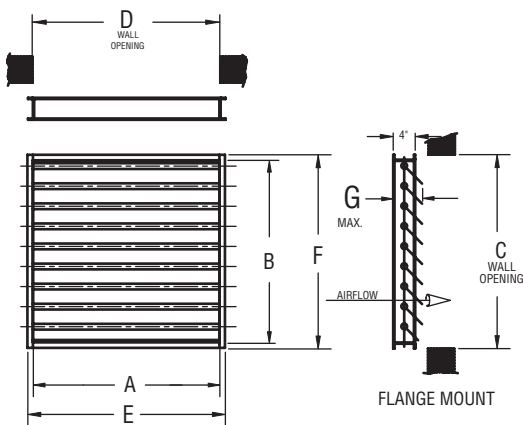
# Dimensions – Series FEP Fiberglass End-Pivoted Automatic Shutter

## Duct Mount

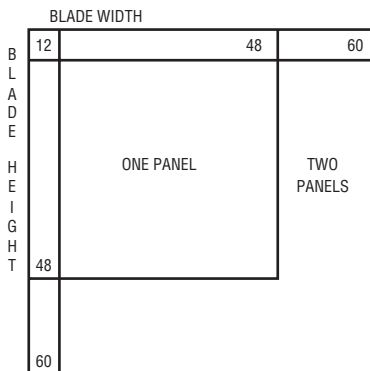


NOMINAL SHUTTER SIZE	A	B	C	D	G
12	12	12	12¼	12¼	6¼
14	14	14	14¼	14¼	6¼
16	16	16	16¼	16¼	6¼
18	18	18	18¼	18¼	6¼
20	20	20	20¼	20¼	6¼
22	22	22	22¼	22¼	8 <sup>13</sup> / <sub>16</sub>
24	24	24	24¼	24¼	6¼
26	26	26	26¼	26¼	8 <sup>13</sup> / <sub>16</sub>
28	28	28	28¼	28¼	8 <sup>13</sup> / <sub>16</sub>
30	30	30	30¼	30¼	8 <sup>13</sup> / <sub>16</sub>
32	32	32	32¼	32¼	8 <sup>13</sup> / <sub>16</sub>
36	36	36	36¼	36¼	8 <sup>13</sup> / <sub>16</sub>
40	40	40	40¼	40¼	8 <sup>13</sup> / <sub>16</sub>
42	42	42	42¼	42¼	8 <sup>13</sup> / <sub>16</sub>
44	44	44	44¼	44¼	8 <sup>13</sup> / <sub>16</sub>
48	48	48	48¼	48¼	8 <sup>13</sup> / <sub>16</sub>
54	54	54	54¼	54¼	8 <sup>13</sup> / <sub>16</sub>
60	60	60	60¼	60¼	8 <sup>13</sup> / <sub>16</sub>

## Flange Mount



NOMINAL SHUTTER SIZE	A	B	C	D	E	F	G
12	12	12	12¼	12¼	14½	14½	6¼
14	14	14	14¼	14¼	16½	16½	6¼
16	16	16	16¼	16¼	18½	18½	6¼
18	18	18	18¼	18¼	20½	20½	6¼
20	20	20	20¼	20¼	22½	22½	8 <sup>13</sup> / <sub>16</sub>
22	22	22	22¼	22¼	24½	24½	6¼
24	24	24	24¼	24¼	26½	26½	6¼
26	26	26	26¼	26¼	28½	28½	6¼
28	28	28	28¼	28¼	30½	30½	8 <sup>13</sup> / <sub>16</sub>
30	30	30	30¼	30¼	32½	32½	8 <sup>13</sup> / <sub>16</sub>
32	32	32	32¼	32¼	34½	34½	8 <sup>13</sup> / <sub>16</sub>
36	36	36	36¼	36¼	38½	38½	8 <sup>13</sup> / <sub>16</sub>
40	40	40	40¼	40¼	42½	42½	8 <sup>13</sup> / <sub>16</sub>
42	42	42	42¼	42¼	44½	44½	8 <sup>13</sup> / <sub>16</sub>
44	44	44	44¼	44¼	46½	46½	8 <sup>13</sup> / <sub>16</sub>
48	48	48	48¼	48¼	50½	50½	8 <sup>13</sup> / <sub>16</sub>
54	54	54	54¼	54¼	56½	56½	8 <sup>13</sup> / <sub>16</sub>
60	60	60	60¼	60¼	62½	62½	8 <sup>13</sup> / <sub>16</sub>



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

Note: Multiple panels fastened together with FRP strips adhered to channel frame. Axles 3/4" Dia. FRP. Axles are 4" long each end through 36", above 36" axles are full blade length.



# Series FLC, Fiberglass Low Velocity Center-Pivoted Damper



**Series FLC**  
Fiberglass, Low Velocity,  
Center-Pivoted Damper

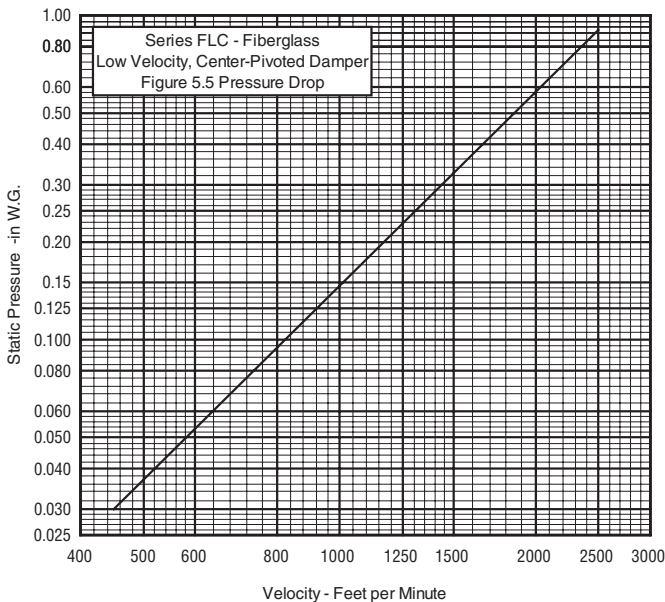


Hartzell Fan, Inc. certifies that the Series FLC - Fiberglass Low Velocity, Center-Pivoted Damper, air performance and leakage ratings shown herein are reliable and accurate and in accordance with industry standards. The ratings shown are based on tests and procedures performed in accordance with AMCA Standard 500.

**Applications** - The Hartzell Series FLC are center-pivoted, manually or motor operated, backdraft dampers constructed entirely of fiberglass. It is recommended for backdraft control applications, used in conjunction with low pressure, low velocity fans such as propeller fans, power roof ventilators, and utility sets. This fiberglass shutter is best suited for applications where corrosive elements exist in fume or vapor form. Maximum temperature is 200°F.

- Maximum Face Velocity – 2,500 FPM.
- Maximum Differential Pressure – 1" W.G.
- Maximum Panel Size – 48" wide x 48" high. Larger size units are available in multiple panel construction with special reinforced manufacturing techniques.
- Minimum panel size is 12" wide x 12" high.

## Performance Data



## Construction Features:

All parts of this product are fiberglass and Isophthalic polyester resin. Joints are bonded with an industrial grade epoxy adhesive, having similar corrosion resistant properties as a polyester resin. The resin has a Class I flame spread rate of 25 or less. All surfaces are protected to be ultra-violet resistant.

Solid fiberglass reinforced plastic shapes and pultrusions utilize stability of fiberglass is excellent. Fiberglass will not become brittle at low temperatures, and at 0°F the laminated fiberglass will be stronger than at room temperature. Fiberglass reinforced plastic has a strength to weight ratio 43% greater than that of aluminum.

- Frame** – 4" x 11/16" x 1/8" fiberglass reinforced polyester.
- Blades** – Minimum .070" thick fiberglass reinforced polyester.
- Linkage** – FRP, airstream mounted on the discharge side of the blade, and connects all blades for synchronous movement.
- Stops** – 1/8" fiberglass reinforced polyester angle.
- Axles** – 3/4" diameter fiberglass reinforced polyester rod.
- Bearings** – Fiber reinforced thermoplastic.
- Standard Color** – Medium gray. Other colors available upon request.

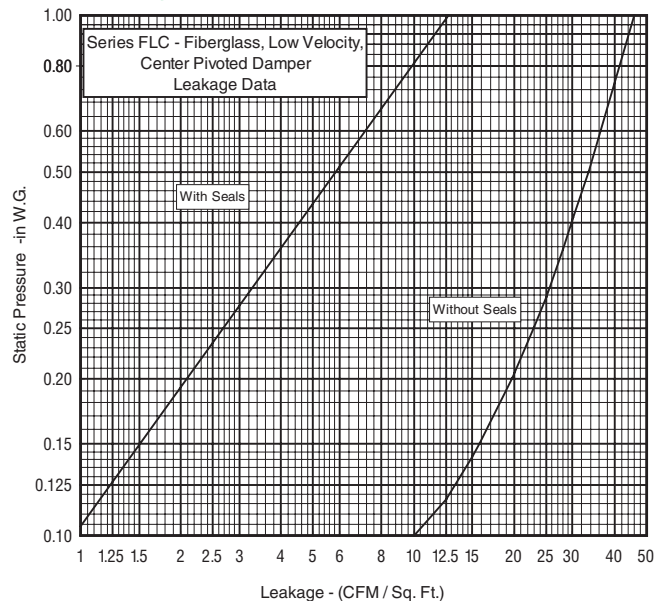
**Mounting Configurations** – Flange Mount reference drawing no. D744. Duct Mount reference drawing no. D745.

**Corrosive Resistant Guide** – Please refer to Corrosion Resistance Guide on Page 3 for topcoat resin application for additional corrosion resistance.

## Options and Accessories

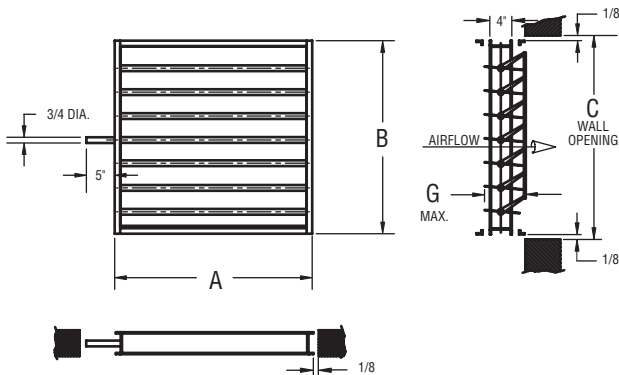
- Insect screen
- Blade seals
- Jamb Seals
- Fiberglass mounting angle
- HartKoate, Hi-Cor, or electrostatically grounded construction.
- For construction options and other accessories please refer to page 2.

## Leakage



# Dimensions – Series FLC Fiberglass Low Velocity, Center-Pivoted Damper

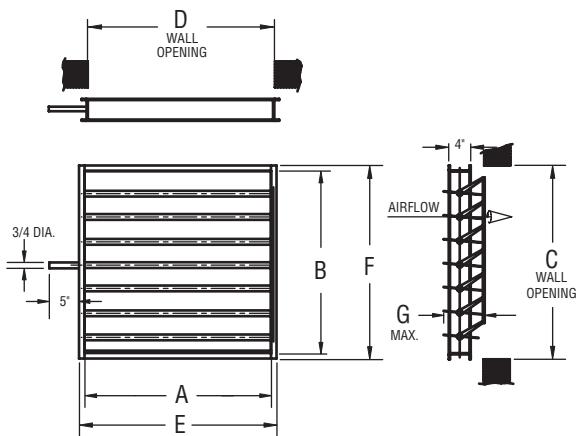
## Duct Mount



Warning: Allowances must be considered to eliminate side axle interference.

NOMINAL DAMPER SIZE	A	B	C	G
12	12	12	12½	6¼
14	14	14	14½	6¼
16	16	16	16½	6¼
18	18	18	18½	6¼
20	20	20	20½	6¼
22	22	22	22½	6¼
24	24	24	24½	6¼
26	26	26	26½	6¼
28	28	28	28½	6¼
30	30	30	30½	6¼
32	32	32	32½	6¼
36	36	36	36½	9½
40	40	40	40½	9½
42	42	42	42½	9½
44	44	44	44½	9½
48	48	48	48½	9½
54	54	54	54½	9½
60	60	60	60½	9½

## Flange Mount



NOMINAL DAMPER SIZE	A	B	C	D	E	F	G
12	12	12	12½	12½	14½	14½	6¼
14	14	14	14½	14½	16½	16½	6¼
16	16	16	16½	16½	18½	18½	6¼
18	18	18	18½	18½	20½	20½	6¼
20	20	20	20½	20½	22½	22½	6¼
22	22	22	22½	22½	24½	24½	6¼
24	24	24	24½	24½	26½	26½	6¼
26	26	26	26½	26½	28½	28½	6¼
28	28	28	28½	28½	30½	30½	6¼
30	30	30	30½	30½	32½	32½	6¼
32	32	32	32½	32½	34½	34½	6¼
36	36	36	36½	36½	38½	38½	9½
40	40	40	40½	40½	42½	42½	9½
42	42	42	42½	42½	44½	44½	9½
44	44	44	44½	44½	46½	46½	9½
48	48	48	48½	48½	50½	50½	9½
54	54	54	54½	54½	56½	56½	9½
60	60	60	60½	60½	62½	62½	9½

BLADE WIDTH	
12	48
48	60
60	

BLADE HEIGHT

ONE PANEL

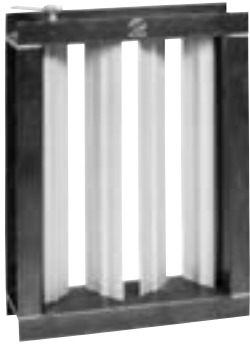
TWO PANELS

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

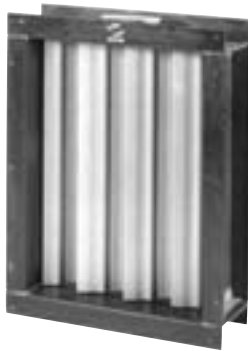
Note: Multiple panels fastened together with FRP strips adhered to channel frame. Axles 3/4" Dia. FRP. Axles are 4" long each end through 36", above 36" axles are full blade length.



# Series FCO & FCP, Fiberglass Volume Control Dampers



**Series FCO**  
Opposed Blade



**Series FCP**  
Parallel Blade

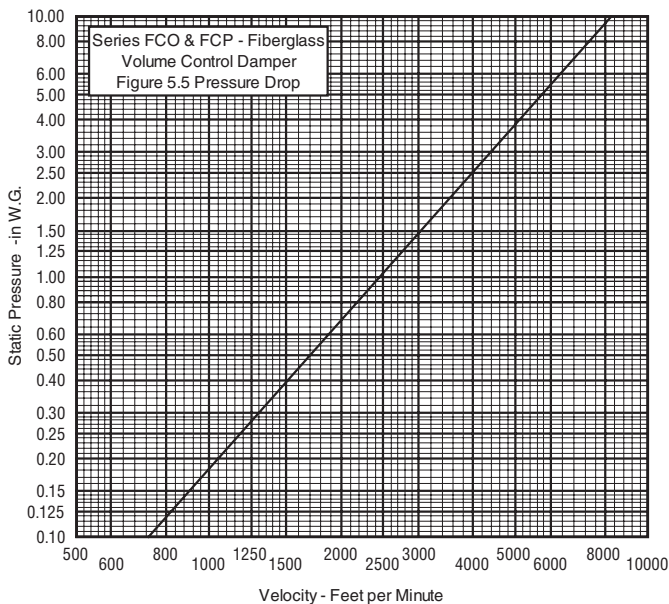


Hartzell Fan, Inc. certifies that the Series FCO and FCP - Fiberglass Volume Control Damper, air performance and leakage ratings shown herein are reliable and accurate and in accordance with industry standards. The ratings shown are based on tests and procedures performed in accordance with AMCA Standard 500.

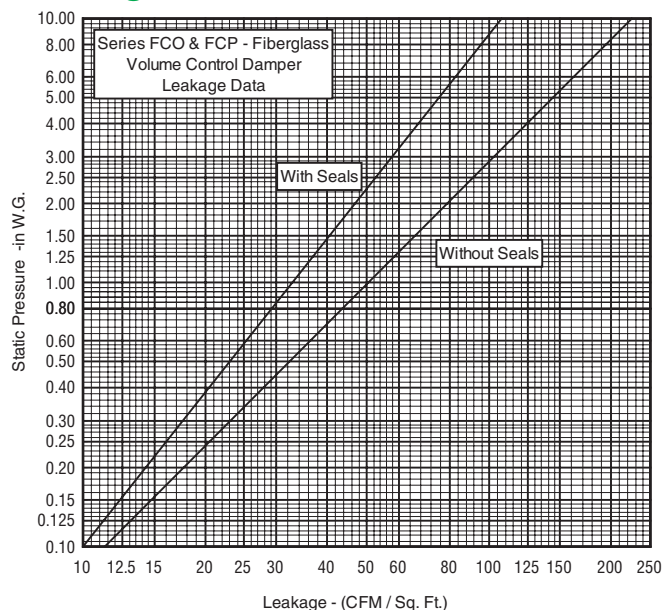
**Applications** - The Hartzell Series FCO and FCP are center pivoted, manually or motor operated, volume control and/or back flow shut-off dampers constructed entirely of fiberglass. Series FCO is opposed blade; Series FCP is parallel blade. These products are recommended for system balance, back flow prevention and/or fan isolation applications used in conjunction with medium- to high-pressure process ventilation or fume exhaust systems. The fiberglass volume control damper is best suited for applications where corrosive elements exist in fume or vapor form. Maximum temperature is 200°F.

- Maximum Face Velocity – 6,000 FPM.
- Maximum Differential Pressure – 20" W.G.
- Maximum Panel Size – Maximum single panel size is determined by the system static pressure. At high pressures, multi-panel may be required. Refer to page 11 for additional details.

## Performance Data



## Leakage



## Construction Features:

All parts of this product are fiberglass and Isophthalic polyester resin. Joints are bonded with an industrial grade epoxy adhesive, having similar corrosion resistant properties as a polyester resin. The resin has a Class I flame spread rate of 25 or less. All surfaces are protected to be ultra-violet resistant.

Solid fiberglass reinforced plastic shapes and pultrusions utilize woven fiberglass mat material for superior strength. The dimensional stability of fiberglass is excellent. Fiberglass will not become brittle at low temperatures, and at 0°F the laminated fiberglass will be stronger than at room temperature. Fiberglass reinforced plastic has a strength to weight ratio 43% greater than that of aluminum.

**Frame** – 8" x 2-11/16" x 3/16" fiberglass reinforced polyester.

**Blades** – Minimum 3/16" thick fiberglass reinforced polyester.

**Linkage** – Stainless steel enclosed in damper frame, outside of airstream.

**Operation** – Control shaft may be located on either side, with options.

**Stops** – 1/8" fiberglass reinforced polyester angle.

**Axles** – 3/4" diameter fiberglass reinforced polyester rod.

**Bearings** – Fiber reinforced thermoplastic.

**Standard Color** – Medium gray. Other colors available upon request

**Mounting Configurations** – Opposed blade reference drawing no. D840. Parallel blade reference drawing no. D841.

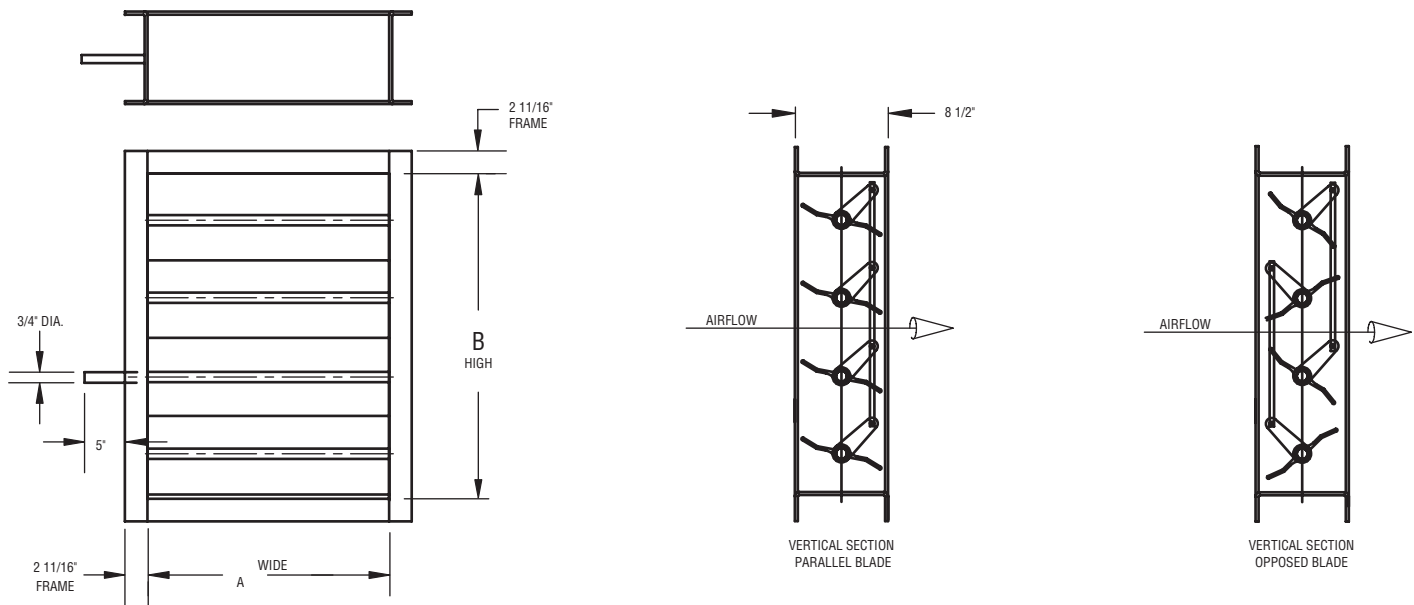
**Corrosive Resistant Guide** – Please refer to Corrosion Resistance Guide on Page 3 for topcoat resin application for additional corrosion resistance.

## Options and Accessories

- Blade seals
- Jamb seals
- Operators and Quadrants
- HartKoate, Hi-Cor, or electrostatically grounded construction.
- For construction options and other accessories please refer to page 2.

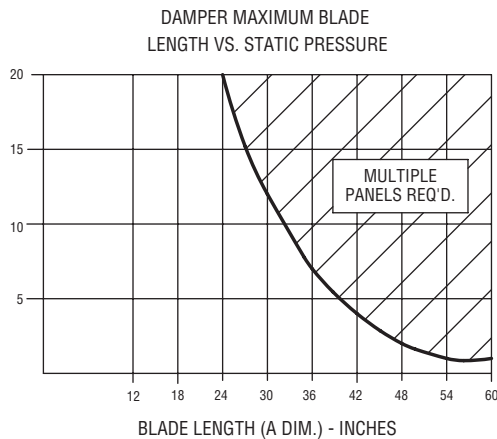


# Dimensions – Series FCO & FCP Fiberglass Volume Control Dampers



Dimensions A and B to match Customer Requirements

## Damper Maximum Blade Length Vs. Static Pressure



Note: Maximum panel size is determined by system static pressure. The above chart indicates maximum blade length as a function of system static pressure. When, at a given pressure condition, longer blades are required, jack-shafted, multi-panel construction shall be used. In those cases additional detail will be supplied on special factory drawings.

## Damper Operational Torque

SIZE	12	18	24	30	36	42	48	54	60
12	1.6	2.4	3.2	4.0	4.8	5.6	6.4	7.2	8.0
18	2.4	3.6	4.8	6.0	7.2	8.4	9.6	10.8	12.0
24	3.2	4.8	6.4	8.0	9.6	11.2	12.8	14.4	15.9
30	4.0	6.0	8.0	10.0	12.0	14.0	15.9	17.9	19.9
36	4.8	7.2	9.6	12.0	14.4	16.8	19.1	21.5	23.9
42	5.6	8.4	11.2	14.0	16.8	19.5	22.3	25.1	27.9
48	6.4	9.6	12.8	15.9	19.1	22.3	25.5	28.7	31.9
54	7.2	10.8	14.4	17.9	21.5	25.1	28.7	32.3	35.9
60	8.0	12.0	15.9	19.9	23.9	27.9	31.9	35.9	39.9

Note:

1. Table equals pressure torque in Inch-Pounds, at 1" differential static pressure.
2. For torque at different pressures, multiply differential pressure by tabulated values.
3. For torque values with jamb seals, multiply tabulated values by 1.36.

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



# 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 months allowance for shipment to approved stocking dealers and 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 and are 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, plus six months allowance for shipment to approved stocking dealers and distributors. In no event will Hartzell be responsible or liable for any labor or other incidental costs associated with the removal or replacement of defective products or materials.

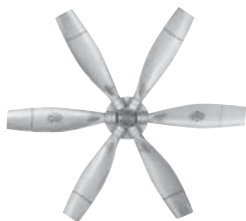
In no event whether as a result of breach of contract, or warranty or alleged negligence, defects, incorrect advice or other causes, shall Hartzell be liable for special or consequential damages, including, but not limited to, loss of profits or revenue, loss of use of the equipment or any associated 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.