AEROVENT

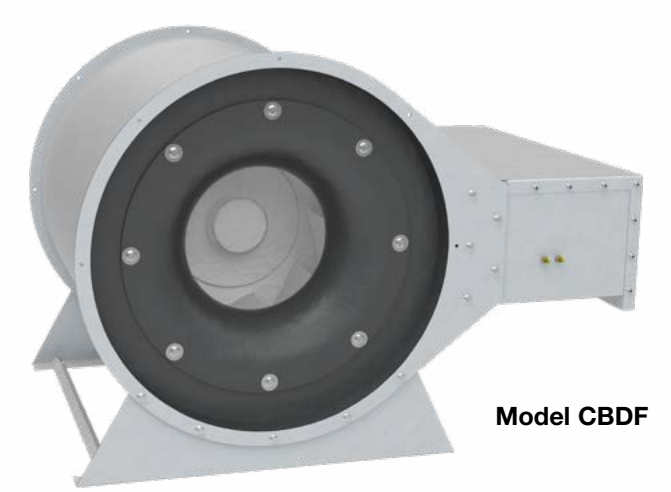
INDUSTRIAL VENTILATION SYSTEMS

FIBERGLASS INLINE CENTRIFUGAL FANS

MODEL: CBDF

CATALOG 360

DECEMBER 2022



Model CBDF

Sizes and Performance
12.4" to 25" impeller diameters
Airflow to 15,200 CFM
Static pressure to 7" w.g.

Ceiling Hung
Model CBDF

AEROVENT
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For complete product performance, drawings and available accessories, download our Fan Selector program at aerovent.com.

Overview

CBDF

Aerovent's Fiberglass CBDF Inline Centrifugal Fan is designed to provide straight-through airflow. This combines the compact advantage of an axial flow fan with the performance characteristics of a centrifugal fan. The Arrangement 9 belt driven Model CBDF offers performance flexibility. The fan's performance can easily be changed by adjusting the motor sheave on adjustable speed drives or by changing the sheaves on constant speed drives. The Model CBDF has a non-overloading power characteristic designed to prevent motor overload under variable operating conditions. Constructed of fiberglass (FRP), the CBDF fan is primarily used for exhausting gases, fumes and vapors from chemical processes.

Airstream parts are constructed of fiberglass reinforced plastic for resistance to a wide variety of acids, alkalies and other chemical agents. Please refer to the "Corrosion Resistance Guide" on page 9 for a list of the specific chemical agents. For applications that require exhausting chemicals that may attack polyester resin, special resins and reinforcing materials are available, as an option, to withstand these conditions.

Advantages of Fiberglass Fans

- Superior corrosion resistance to gases, fumes and vapors
- Lower maintenance costs
- More economical than stainless steel construction
- Lighter weight than steel

Typical Applications Include

Chemical, Food Processing, Pulp and Paper, Water and Wastewater, Generator Room Ventilation, Swimming Pool Exhaust, Kitchen Exhaust, Dish Water Exhaust, Plating Process Exhaust

Arrangements

Available in Arrangement 9, Belt Driven

Configurations

Vertical and horizontal mount configurations

Impeller Types

Backward Inclined Airflow

Optional Construction

Special Materials, Spark Resistant Construction, Static Grounding with Graphite

Roof Ventilator Design

CBDF

For roof mounted exhaust applications, the Fiberglass CBDF Inline Centrifugal Fan can be converted into a roof ventilator with the addition of a fiberglass stack cap, curb cap and motor cover. See page 13 for dimensional data.

Note: When selecting performances from the rating tables for the roof ventilator design (with stack cap), allow 1/8" for stack cap loss. A minimum flow rate is required to fully open the stack cap damper blades. Please refer to the chart below.

Design Advantages

- Offers a quiet and efficient roof ventilator
- Offers a long service life for fume exhaust applications
- Permits fumes to be exhausted high above the roof line and away from surrounding ventilation systems

Construction Features

- The stack cap windband section is constructed from a one-piece mold with drain channels and drain holes to allow water to flow out.
- The stack cap damper blades are reinforced with a turned-down flange at the blade edge that seals the fan discharge when the fan is shut off.
- The stack cap damper rods are constructed of fiberglass with PVC bearings to offer a long service life.
- The curb cap is constructed from a one-piece mold that offers a no-seam base, thus eliminating the chance of water leakage.
- The curb cap is reinforced to offer additional support for a long service life.

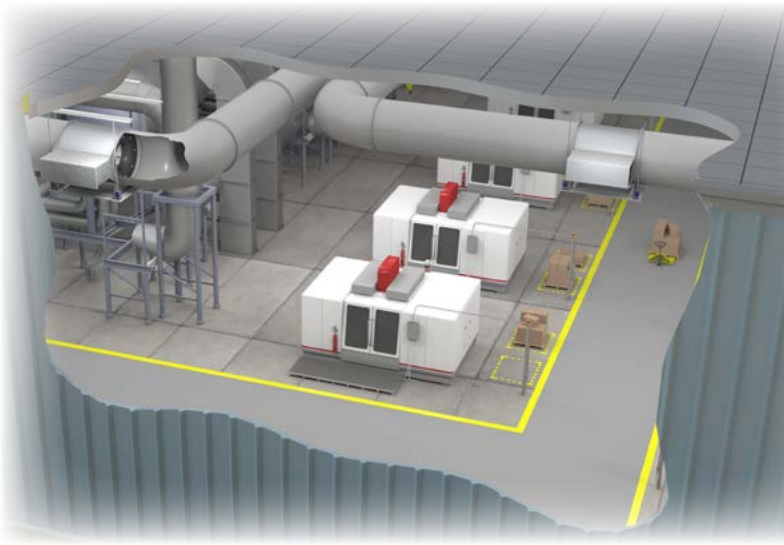
Design Features

Stack Caps – Designed with backdraft dampers that protect the interior of the building from precipitation when the fan is shut off. Minimum outlet velocity of 1700 FPM required for full open damper operation. Maximum outlet velocity not to exceed 3000 FPM. (See table to the right.)

Curb Caps – Designed for mounting vertical fans on roof curbs and to provide easy installation of the unit.

Motor Covers – Designed to protect the motor and drive parts from the weather and to dissipate motor heat through the vents.

Wastewater Treatment Roof Ventilator Application



Manufacturing Plant Application

Minimum CFM (m^3/s) Values

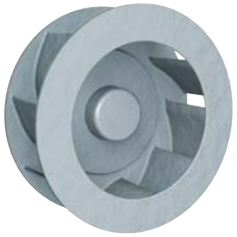
The following table shows the minimum CFM (m^3/s) required to fully open the fiberglass damper blades.

FAN SIZE	MINIMUM VOLUME	
	CFM (ENGLISH)	m^3/s (METRIC)
12	2700	1.274
16	4700	2.218
20	7600	3.587
25	15000	7.080

Standard Construction

Housings with Integral Flanges
Constructed of fire-retardant polyester resin reinforced with glass cloth and mat to provide resistance to most chemicals and long service life. The bearing base and drive enclosure are supported by tapered gussets interlocked into the outer housing. These structural parts are constructed of laminated glass and resin.

Impeller Design
Aerovent's CBDF fiberglass "AFA" impeller design features a backward inclined airfoil blade. This impeller design offers a power limiting characteristic with the added advantage of high operating efficiency and low noise levels.



CBDF Impeller

Straightening Vanes
Designed to improve the efficiency and the pressure characteristics by minimizing turbulence downstream from the fan and converting rotational energy at the impeller discharge into useful work. Constructed of laminated glass and resin interconnected to the inner and outer shell.

Flanged Inlet and Outlet With Drilled Bolt Pattern
Designed to ensure housing concentricity and housing strength, while permitting easy duct mounting.

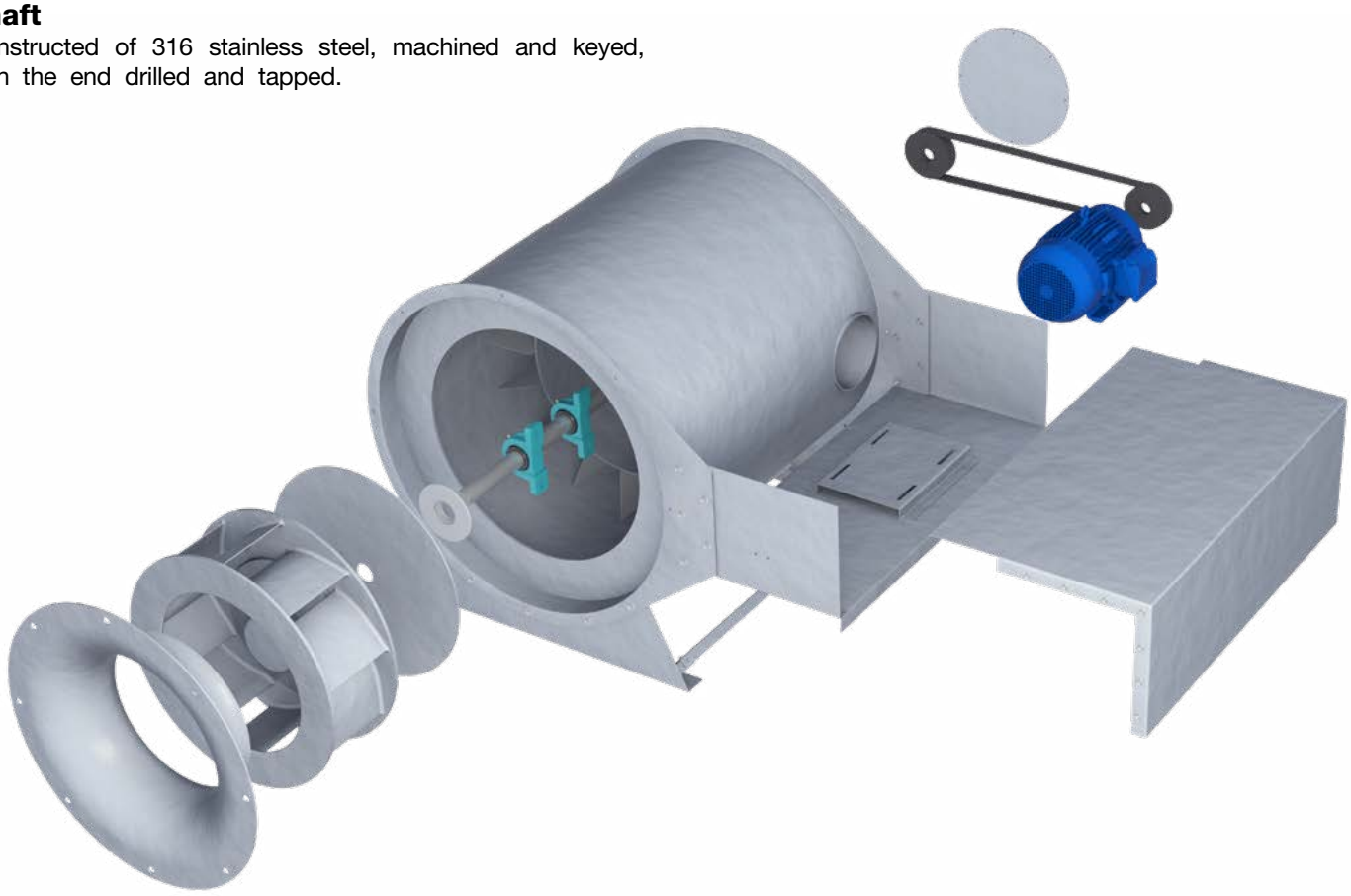
Shaft
Constructed of 316 stainless steel, machined and keyed, with the end drilled and tapped.

Shaft Seal
Heavy Viton type that rides against a heavy Teflon wear plate to protect the shaft and bearings from contact with the airstream. Seal is not gas tight.

Bearings
Sealed pillow block type to provide long service. The sealed bearing cover is designed to protect the bearings and belts from airstream contaminants. Bearing lubrication lines are extended to the outside of the fan housing for ease of maintenance.

Motor Base
Constructed of steel and bolted between wide gussets integral to the fan housing flanges. Designed with a slide rail base for belt tension adjustment. A fiberglass reinforced plastic motor cover is available as an option to protect personnel from the moving drive components and to protect the motor from the weather.

Product Finish
All fiberglass parts are coated inside and outside with resin, approximately 10 mils in thickness, to seal and provide protection from ultra-violet light. This results in a smooth, high gloss finish. All steel parts are finished with gray epoxy paint.



Special Fiberglass Materials
Please contact the factory to ensure a suitable material is selected for the specific application.

- **Vinyl Ester** — Provides increased corrosion resistance to stronger acids, chlorine, and oxidizing agents. For use in industrial applications such as chemical and water treatment plants, and commercial applications where urban or salt-air corrosion exists.
- **Surface Veil** — Produces a smooth, reinforced final surface with greater corrosion resistance and protection from ultraviolet rays.
- **Fire-Retardant Resin** — Reduces the resin's tendency to burn by achieving a flame-spread rating of 25 or less.

Spark Resistant Construction
Spark resistant construction for fiberglass fans is recommended when the fan is handling explosive fumes. Although fiberglass is a non-sparking material, it can build and retain a static charge that can be potentially hazardous. With spark resistant construction, the fan is statically grounded by graphite impregnation to reduce a static charge build-up.

Exterior 316 Stainless Steel Hardware
Exterior 316 stainless steel hardware is recommended when the environment outside the airstream is corrosive.

Mounting Configurations

Vertical Construction
Vertical construction is available on sizes 12 through 25.

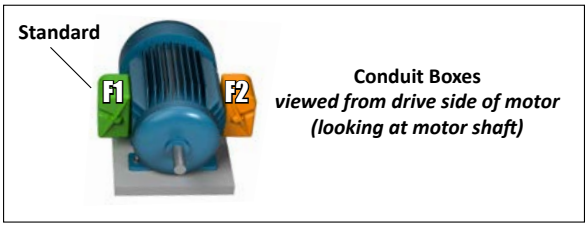
Vertical (VUN/VDN) — For mounting configurations where support brackets are not required.

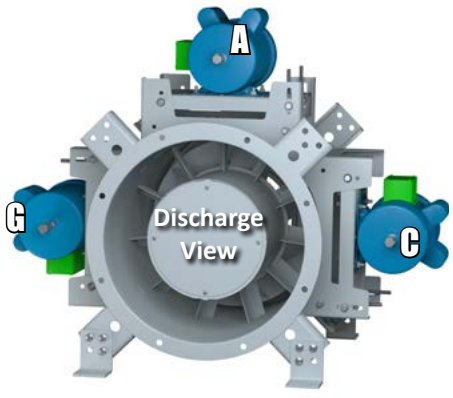
VDN
Vertical Down
No Brackets

VUN
Vertical Up
No Brackets

Horizontal Construction
Horizontal construction is available on sizes 12 through 25.

Horizontal Base Mounted (HBM) — Support legs are provided at each end of the fan for floor mounting.





HBM
Horizontal Base
Mounted

HOR
Horizontal
Flange Mounted

Options/Accessories

Horizontal Support Legs

1. **Motor Cover** The fiberglass motor cover extends over the entire base, motor and drive assembly to protect personnel from the moving drive parts and to protect the motor from precipitation.

2. **Housing Drain** A 1" PVC pipe with a female pipe thread is located in the housing to permit drainage of liquid. For horizontal applications only.

3. **Inlet and Outlet Screen – 304 or 316 Stainless Steel** Screens offer protection to personnel from the fan's moving parts and are recommended for use when no ductwork is attached to the inlet and/or outlet. Inlet and outlet screens are constructed of expanded metal in 304 or 316 stainless steel.

4. **Stack Cap** Stack caps are designed for vertical, rooftop discharge with butterfly type dampers to seal out the weather when the fan is shut off.

5. **Curb Cap** Attached to the fan's inlet flange for curb mounting. Standard accessory on vertical roof mounted configuration.

6. **Horizontal Support Legs** Support legs are available for standard platform (ceiling suspended) or floor mounting and are bolted to the inlet and outlet flanges. The support legs are constructed of steel and are coated with gray epoxy paint. Isolators are available for ceiling suspended (inline type for use with threaded rods) or floor mounted.

7. **Bolted Inspection Door** The bolted inspection door is recommended to inspect the internal parts of the fan.

8. **NEMA 4 Disconnect Switch** A NEMA 4 disconnect switch is mounted externally and is water and dust-tight. Switch is available shipped loose for field mounting and wiring or factory mounted and wired. (See page 7 for additional disconnect switch options.)

Other Accessories Include:

- Stainless Steel Hardware
- Fiberglass Repair Kit

Disconnect switches provide positive electrical shutoff during fan cleaning or maintenance.

NEMA 1 Disconnect Switch (Standard)

A NEMA 1 disconnect switch is available shipped loose for field mounting and wiring or factory mounted and wired with ODP or TEFC motors. For indoor applications.

NEMA 3R Disconnect Switch

A NEMA 3R, rain proof, disconnect is available shipped loose for field mounting and wiring or factory mounted and wired externally.

NEMA 4 Disconnect Switch

A NEMA 4, water and dust tight, disconnect is available shipped loose for field mounting and wiring or factory mounted and wired externally.

NEMA 7/9 Disconnect Switch

A NEMA 7/9 disconnect switch is recommended on fans with explosion proof motors. The NEMA 7/9 switch is designed for use with fans operating in hazardous environments. Available shipped loose for field mounting and wiring. (Not shown.)

NEMA 1
Disconnect Switch

NEMA 3R
Disconnect Switch

NEMA 4
Disconnect Switch

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INDUSTRIAL VENTILATION SYSTEMS

Installation Photos

Ventilation of Pool and
Chemical Storage Areas

Performance Correction For Temperature and Altitude

The performance tables in this catalog are based on standard air density: 70°F at sea level (0.075 lbs./cu.ft. density). The fan performance tables provide the fan RPM and brake horsepower requirements for the given CFM and static pressure, at standard air density.

When the fan performance is not at standard conditions, the performance must be converted to standard conditions before entering the fan performance tables. The fan performance is converted to standard conditions by using the "Temperature and Altitude Density Ratio" from Table 1 below.

The following is an example explaining how to convert the fan's performance to standard conditions.

Example: A Size 25 CBDF is to provide 8,010 CFM at 2.5" SP, at 150°F at 1,000 ft. elevation (0.0628 lbs./cu. ft. density).

- For 150°F and 1,000 ft. elevation, the temperature and altitude density ratio table shows a density ratio of 0.838.
- The operating static pressure is 2.5" SP.
- Using the temperature and altitude density ratio, the static pressure at standard conditions is determined as follows:

Operating SP ÷ *Temp. & Alt. Density Ratio* = *SP at Std. Conditions*

For this example:

2.5" SP ÷ 0.838 = 3" SP at Standard Conditions

Turn to page 11 for the Size 25 CBDF fan performance table. Using 8,010 CFM at 3" SP at standard conditions, find the RPM and brake horsepower. The answer is 1,572 RPM and 6.34 BHP. **Note:** 6.34 BHP is the brake horsepower required at standard conditions and is also referred to as the "cold brake horsepower" or "starting brake horsepower."

The actual brake horsepower at the operating condition of 150°F and 1,000 ft. elevation is determined by the following equation:

BHP at Std. Conditions x *Temp. & Alt. Density Ratio* = *BHP at Oper. Conditions*

For this example:

6.34 x 0.838 = 5.31 BHP at Operating Conditions

Therefore, the Size 25 CBDF fan providing 8,010 CFM at 2.5" SP, at 150°F will run at 1,572 RPM and will require 5.31 BHP at operating conditions and 6.34 BHP at starting.

Maximum Safe Speeds

When operating at temperatures other than 70°F, the maximum speed of the fan is affected. To determine the maximum speed at the operating temperature, a "Maximum Safe Speed Temperature Factor" (Table 3) is applied to the "Maximum Safe Speed at 70°F" (Table 2).

Table 2. Maximum Safe Speed at 70°F

FAN SIZE	MAXIMUM SPEED (RPM)
12	4005
16	3153
20	2523
25	2002

Table 3. Maximum Safe Speed Temperature Factors

TEMPERATURE °F	TEMPERATURE °C	FACTOR
70	21	1.00
100	38	1.00
150	66	0.85
200	93	0.55

Example: The maximum safe speed for a Size 25 CBDF operating at 150°F is 1,702 RPM. The calculation is shown below.

Max. RPM at 70°F (Table 2) x *Temp. Factor (Table 3)* = *Max. RPM at Operating Temp.*

For this example:

2,002 x 0.85 = 1,702 Max. RPM at 150°F

To use the performance tables for metric values, a "Metric Conversion Factors" table is included below for converting metric volume flow and pressure to English units and back to metric.

Table 4. Metric Conversion Factors

DESCRIPTION	ENGLISH UNIT	METRIC UNIT	CONVERSION FACTOR	
			ENGLISH TO METRIC	METRIC TO ENGLISH
VOLUME	CFM	m^3/s	.000472	2118.90
PRESSURE	inches w.g.	kPa	.24866	4.02156
POWER	BHP	kW	.74570	1.3410
VELOCITY	fpm	m/s	.00508	196.85
SPEED	RPM	rps	.01667	60.00
AREA	ft^2	m^2	.09290	10.7640
CIRCUMFERENCE	ft	m	.30480	3.2808
DIAMETER	in.	mm	25.400	0.03937

Table 1. Temperature and Altitude Density Ratios

AIR TEMP °F	ALTITUDE IN FEET ABOVE SEA LEVEL											
	0	1000	2000	3000	4000	5000	66000	7000	8000	9000	10000	15000
	BAROMETRIC PRESSURE IN INCHES OF MERCURY											
	29.92	28.86	27.82	266.82	25.84	24.90	23.98	23.09	22.22	21.39	20.58	16.89
–50	1.293	1.247	1.201	1.159	1.116	1.076	1.036	0.997	0.960	0.924	0.889	0.729
0	1.152	1.111	1.071	1.032	0.995	0.959	0.923	0.889	0.856	0.824	0.792	0.650
50	1.039	1.003	0.967	0.932	0.897	0.864	0.833	0.801	0.772	0.743	0.715	0.586
70	1.000	0.964	0.930	0.896	0.864	0.832	0.801	0.772	0.743	0.714	0.688	0.564
100	0.946	0.912	0.880	0.848	0.818	0.787	0.758	0.730	0.703	0.676	0.651	0.534
150	0.869	0.838	0.808	0.770	0.751	0.723	0.696	0.671	0.646	0.620	0.598	0.490
200	0.803	0.774	0.747	0.720	0.694	0.668	0.643	0.620	0.596	0.573	0.552	0.453

The following table lists gases, fumes and vapors that are commonly exhausted from chemical processes. Using the "Legend of Symbols," the table indicates how Aerovent's standard fiberglass fans will withstand exhausting the particular gas, fume or vapor.

This data is based on a maximum temperature of 200°F (93°C).

Legend of Symbols

S — Satisfactory Application
L — Limited Life or Life Tests Incomplete
U — Unsatisfactory

APPLICATION	SATURATED VAPOR	DRY VAPOR	EXCESS DRY AIR	APPLICATION	SATURATED VAPOR	DRY VAPOR	EXCESS DRY AIR
ACIDS				**ALKALINE SALTS**			
Acetic	L	S	S	Sodium Bicarbonate	L	S	S
Aqua Regia	U	U	L	Sodium Carbonate	L	S	S
Boric	S	S	S	Sodium Chloride	L	S	S
Butyric	S	S	S	Sodium Cyanide	L	S	S
Carbonic	S	S	S	Trisodium, Phosphate	L	L	S
Chromic	S	S	S	**ALKALIS**			
Citric	S	S	S	Ammonium Hydroxide	U	L	S
Formic	L	S	S	Calcium Hydroxide	U	L	S
Hydrochloric	S	S	S	Potassium Hydroxide	U	L	S
Hydrocyanic	L	S	S	Sodium Hydroxide	U	L	S
*Hydrofluoric	L	S	S	Sodium Hypochlorite	U	L	S
Hypochlorous	L	S	S	**KETONES**			
Lactic	S	S	S	Acetone	U	L	S
Maleic	S	S	S	Methyl Ethyl Ketone	U	U	L
Nitric	L	S	S	Methyl Isobutyl Ketone	U	U	L
Oleic	S	S	S	**ESTERS**			
Oxalic	S	S	S	Butyl Acetate	U	L	S
Perchloric	U	U	U	Ethyl Acetate	U	U	S
Phosphoric	S	S	S	Zinc Acetate	S	S	S
Picric	L	S	S	**GASES**			
Stearic	S	S	S	Ammonia	L	S	S
Sulfuric	S	S	S	Bromine	U	U	U
Sulfurous	S	S	S	Carbon Dioxide	S	S	S
Tannic	S	S	S	Carbon Disulfide	L	L	S
Tartaric	S	S	S	Chlorine	L	S	S
SALTS, ACID & NEUTRAL				*Fluorine	L	S	S
Alum	S	S	S	*Hydrogen Fluoride	L	S	S
Aluminum Chloride	S	S	S	Hydrogen Sulfide	S	S	S
Aluminum Sulphate	S	S	S	Sulfur Dioxide	S	S	S
Ammonium Chloride	S	S	S	**HYDROCARBONS**			
Ammonium Nitrate	S	S	S	Benzene	U	U	U
Ammonium Sulphate	S	S	S	Fuel Oil	S	S	S
Calcium Chloride	S	S	S	Gasoline	S	S	S
Calcium Sulphate	S	S	S	Kerosene	S	S	S
Copper Chloride	S	S	S	Lubricating Oil	S	S	S
Copper Sulphate	S	S	S	Mineral Oil	S	S	S
Ferric Chloride	S	S	S	Toluene	U	U	U
Ferric Nitrate	S	S	S	Vegetable Oil	S	S	S
Ferric Sulphate	S	S	S	Naphtha	S	S	S
Magnesium Salts	S	S	S	Methane	S	S	S
Nickel Salts	S	S	S	Butane	S	S	S
Potassium Chloride	S	S	S	Propane	S	S	S
Potassium Nitrate	S	S	S	Xylol	S	S	S
Potassium Sulphate	S	S	S	**CHLORINATED SOLVENTS**			
Sodium Chloride	S	S	S	Carbon Tetrachloride	L	S	S
Sodium Sulphate	S	S	S	Chlorobenzene	U	U	U
Sodium Sulphite	S	S	S	Chloroform	U	U	U
Stannous Chloride	S	S	S	Perchlorethylene	U	U	L
Zinc Chloride	S	S	S	Trichlorethylene	U	U	L
Zinc Sulphate	S	S	S				
ALCOHOLS	S	S	S	**GLYCOLS**	S	S	S

* Surface finished with Synthetic Surfacing Veil Required.

CBDF | Size 12

Outlet Area = 1.80 Sq. Ft. **Tip Speed = 3.25 x RPM**

CFM	OV	STATIC PRESSURE (INCHES W.G.)															
		0.5"		1.0"		1.5"		2.0"		2.5"		3.0"		3.5"		4.0"	
		RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
720	400	1214	0.09	1548	0.19	1827	0.29	2076	0.40								
900	500	1346	0.12	1642	0.23	1904	0.35	2136	0.47	2349	0.61	2547	0.75				
1080	600	1492	0.16	1760	0.28	1998	0.42	2219	0.56	2420	0.70	2607	0.86	2784	1.01	2953	1.18
1260	700	1646	0.20	1893	0.34	2112	0.49	2315	0.65	2507	0.81	2687	0.98	2855	1.15	3016	1.33
1440	800	1805	0.25	2037	0.41	2241	0.57	2428	0.75	2607	0.93	2778	1.11	2940	1.30	3095	1.49
1620	900	1969	0.31	2188	0.48	2378	0.66	2556	0.85	2722	1.05	2881	1.25	3036	1.46	3185	1.67
1800	1000	2137	0.39	2343	0.57	2525	0.77	2691	0.97	2849	1.18	2999	1.40	3143	1.62	3284	1.85
1980	1100	2308	0.47	2502	0.68	2676	0.89	2834	1.11	2984	1.33	3127	1.56	3264	1.80	3397	2.05
2160	1200	2482	0.57	2665	0.79	2831	1.02	2983	1.25	3125	1.49	3262	1.74	3393	1.99	3520	2.25
2340	1300	2658	0.69	2830	0.92	2989	1.17	3136	1.42	3273	1.67	3403	1.93	3528	2.20	3650	2.48
2520	1400	2835	0.82	2998	1.07	3150	1.33	3291	1.60	3424	1.87	3549	2.14	3669	2.43	3786	2.72
2700	1500	3014	0.97	3169	1.24	3313	1.51	3450	1.79	3578	2.08	3700	2.37	3815	2.67	3927	2.97
2880	1600	3194	1.14	3341	1.42	3479	1.72	3610	2.01	3735	2.31	3853	2.62	3965	2.94		
3060	1700	3375	1.32	3515	1.63	3648	1.94	3773	2.25	3893	2.57						
3240	1800	3557	1.53	3691	1.85	3817	2.18	3939	2.51								
3420	1900	3740	1.77	3867	2.10	3989	2.44										
3600	2000	3923	2.02														

CFM	OV	STATIC PRESSURE (INCHES W.G.)															
		4.5"		5.0"		5.5"		6.0"		6.5"		7.0"		7.5"		8.0"	
		RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
1080	600	3114	1.36														
1260	700	3169	1.51	3318	1.70	3461	1.90	3599	2.10	3732	2.31						
1440	800	3243	1.69	3385	1.89	3522	2.10	3654	2.31	3784	2.53	3910	2.75				
1620	900	3328	1.88	3465	2.10	3598	2.32	3726	2.54	3850	2.77	3971	3.00				
1800	1000	3422	2.08	3555	2.31	3683	2.55	3808	2.79	3929	3.04						
1980	1100	3526	2.29	3653	2.54	3777	2.80	3898	3.05								
2160	1200	3642	2.52	3763	2.79	3881	3.06	3997	3.33								
2340	1300	3768	2.76	3883	3.04	3995	3.33										
2520	1400	3900	3.01														

CBDF | Size 16

Outlet Area = 2.68 Sq. Ft. **Tip Speed = 4.12 x RPM**

CFM	OV	STATIC PRESSURE (INCHES W.G.)															
		0.5"		1.0"		1.5"		2.0"		2.5"		3.0"		3.5"		4.0"	
		RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
1072	400	928	0.14	1199	0.28	1424	0.44										
1340	500	1018	0.18	1262	0.34	1474	0.52	1661	0.72	1833	0.92						
1608	600	1120	0.23	1341	0.42	1537	0.62	1715	0.84	1877	1.06	2029	1.30	2172	1.55	2307	1.81
1876	700	1230	0.28	1433	0.50	1612	0.73	1780	0.96	1936	1.21	2080	1.47	2216	1.73	2346	2.01
2144	800	1343	0.35	1533	0.59	1700	0.84	1855	1.10	2002	1.38	2142	1.66	2273	1.95	2397	2.24
2412	900	1460	0.43	1639	0.69	1797	0.97	1942	1.25	2079	1.55	2211	1.86	2337	2.17	2458	2.49
2680	1000	1580	0.53	1750	0.81	1898	1.11	2036	1.42	2165	1.74	2289	2.07	2408	2.41	2524	2.75
2948	1100	1703	0.64	1864	0.95	2005	1.27	2135	1.60	2259	1.94	2376	2.30	2489	2.66	2599	3.03
3216	1200	1827	0.77	1979	1.10	2116	1.45	2240	1.80	2357	2.17	2470	2.54	2577	2.93	2681	3.33
3484	1300	1954	0.92	2098	1.28	2229	1.64	2348	2.02	2460	2.41	2568	2.81	2671	3.22	2771	3.63
3752	1400	2081	1.09	2218	1.47	2343	1.86	2459	2.26	2567	2.67	2670	3.09	2769	3.52	2865	3.96
4020	1500	2210	1.29	2340	1.69	2460	2.10	2572	2.53	2677	2.96	2776	3.40	2871	3.86	2964	4.32
4288	1600	2340	1.50	2463	1.93	2578	2.37	2687	2.82	2789	3.28	2885	3.74	2977	4.21	3066	4.70
4556	1700	2470	1.75	2588	2.20	2699	2.66	2803	3.13	2902	3.61	2996	4.10	3085	4.60		
4824	1800	2602	2.01	2714	2.49	2820	2.98	2921	3.48	3016	3.98	3108	4.49				
5092	1900	2734	2.31	2841	2.82	2943	3.33	3040	3.85	3133	4.38						
5360	2000	2866	2.64	2969	3.17	3067	3.71										
5628	2100	2999	3.00	3098	3.55												
5896	2200	3133	3.39														

CFM	OV	STATIC PRESSURE (INCHES W.G.)															
		4.5"		5.0"		5.5"		6.0"		6.5"		7.0"		7.5"		8.0"	
		RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
1876	700	2470	2.30	2589	2.60	2704	2.90										
2144	800	2516	2.55	2631	2.86	2741	3.18	2849	3.52	2953	3.86	3054	4.21				
2412	900	2573	2.82	2683	3.15	2790	3.49	2893	3.84	2994	4.19	3092	4.56				
2680	1000	2636	3.10	2744	3.46	2847	3.83	2947	4.19	3045	4.57	3139	4.95				
2948	1100	2706	3.41	2810	3.79	2911	4.17	3009	4.57	3103	4.97						
3216	1200	2783	3.73	2882	4.13	2980	4.54	3075	4.96								
3484	1300	2867	4.06	2962	4.49	3055	4.93	3146	5.37								
3752	1400	2958	4.41	3049	4.87	3138	5.33										
4020	1500	3054	4.79	3141	5.27												
4288	1600	3153	5.19														

CBDF | Size 20

Outlet Area = 4.67 Sq. Ft. **Tip Speed = 5.15 x RPM**

CFM	OV	STATIC PRESSURE (INCHES W.G.)															
		0.5"		1.0"		1.5"		2.0"		2.5"		3.0"		3.5"		4.0"	
		RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
1868	400	774	0.24	982	0.48	1156	0.74	1312	1.03								
2335	500	861	0.32	1045	0.60	1208	0.90	1353	1.22	1486	1.56	1610	1.92	1726	2.30		
2802	600	957	0.41	1123	0.73	1271	1.08	1408	1.44	1534	1.82	1651	2.21	1761	2.61	1867	3.04
3269	700	1058	0.53	1211	0.89	1347	1.28	1473	1.68	1592	2.10	1704	2.53	1810	2.98	1910	3.43
3736	800	1162	0.67	1306	1.07	1432	1.49	1549	1.94	1659	2.41	1765	2.88	1866	3.36	1963	3.86
4203	900	1269	0.84	1405	1.28	1523	1.74	1633	2.23	1736	2.73	1835	3.25	1930	3.78	2023	4.32
4670	1000	1379	1.04	1506	1.52	1619	2.02	1722	2.55	1820	3.09	1913	3.65	2003	4.22	2090	4.81
5137	1100	1490	1.27	1610	1.80	1718	2.34	1816	2.90	1909	3.48	1998	4.08	2083	4.70	2165	5.32
5604	1200	1604	1.54	1716	2.11	1819	2.70	1914	3.30	2002	3.92	2087	4.55	2168	5.21	2247	5.87
6071	1300	1718	1.86	1824	2.47	1923	3.10	2014	3.74	2099	4.40	2180	5.07	2257	5.76	2333	6.47
6538	1400	1834	2.22	1934	2.87	2028	3.54	2116	4.23	2198	4.93	2276	5.64	2350	6.37	2423	7.11
7005	1500	1950	2.62	2045	3.32	2135	4.04	2219	4.76	2299	5.50	2374	6.26	2446	7.02	2516	7.80
7472	1600	2067	3.08	2158	3.83	2243	4.58	2324	5.35	2401	6.13	2474	6.93				
7939	1700	2185	3.60	2271	4.38	2353	5.18	2430	5.99	2505	6.82						
8406	1800	2303	4.17	2385	5.00	2464	5.84										
8873	1900	2422	4.81	2501	5.68												

CFM	OV	STATIC PRESSURE (INCHES W.G.)															
		4.5"		5.0"		5.5"		6.0"		6.5"		7.0"		7.5"		8.0"	
		RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
2802	600	1967	3.48	2064	3.94												
3269	700	2006	3.90	2098	4.38	2188	4.88	2274	5.40	2358	5.93	2439	6.47				
3736	800	2056	4.37	2144	4.89	2230	5.41	2313	5.95	2393	6.51	2472	7.08				
4203	900	2112	4.87	2198	5.43	2281	6.00	2361	6.57	2439	7.16	2514	7.75				
4670	1000	2175	5.40	2258	6.00	2338	6.61	2416	7.23	2492	7.86						
5137	1100	2245	5.96	2324	6.61	2401	7.26	2476	7.92								
5604	1200	2323	6.55	2397	7.24	2470	7.94										
6071	1300	2406	7.18	2477	7.91												
6538	1400	2493	7.86														

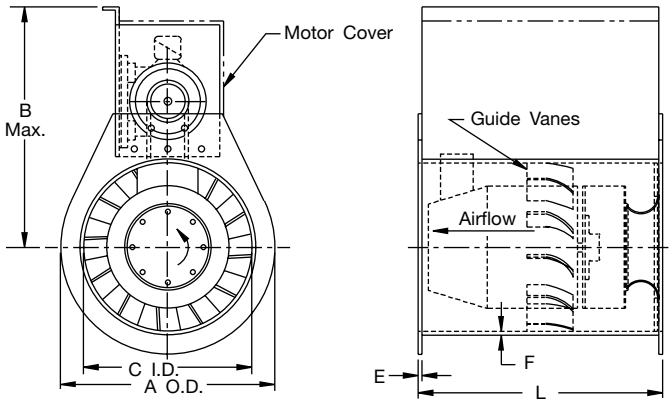
CBDF | Size 25

Outlet Area = 8.01 Sq. Ft. **Tip Speed = 6.49 x RPM**

CFM	OV	STATIC PRESSURE (INCHES W.G.)															
		0.5"		1.0"		1.5"		2.0"		2.5"		3.0"		3.5"		4.0"	
		RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
3204	400	636	0.42	794	0.82	929	1.26	1050	1.73	1160	2.24						
4005	500	713	0.56	853	1.04	978	1.54	1090	2.08	1193	2.64	1289	3.22	1380	3.85	1466	4.49
4806	600	798	0.74	924	1.28	1036	1.86	1141	2.47	1239	3.10	1330	3.75	1415	4.42	1497	5.11
5607	700	885	0.96	1003	1.57	1106	2.21	1201	2.90	1292	3.60	1379	4.32	1461	5.07	1539	5.83
6408	800	976	1.23	1086	1.91	1182	2.62	1271	3.37	1355	4.15	1435	4.95	1513	5.76	1588	6.59
7209	900	1070	1.55	1173	2.30	1263	3.08	1346	3.90	1425	4.74	1500	5.61	1572	6.51	1643	7.41
8010	1000	1165	1.94	1261	2.76	1348	3.61	1426	4.49	1501	5.40	1572	6.34	1640	7.30	1706	8.29
8811	1100	1262	2.40	1352	3.29	1434	4.21	1510	5.16	1580	6.14	1647	7.14	1712	8.17	1775	9.22
9612	1200	1360	2.93	1444	3.90	1522	4.89	1595	5.91	1663	6.95	1727	8.02	1789	9.11	1849	10.23
10413	1300	1459	3.55	1538	4.59	1613	5.65	1682	6.74	1748	7.86	1809	8.99	1868	10.15	1925	11.33
11214	1400	1559	4.25	1634	5.37	1704	6.51	1771	7.67	1834	8.85	1894	10.06	1951	11.28		
12015	1500	1659	5.05	1730	6.25	1797	7.46	1861	8.69	1922	9.95	1980	11.22				
12816	1600	1760	5.96	1828	7.23	1892	8.52	1953	9.82								
13617	1700	1862	6.98	1926	8.32	1987	9.68										
14418	1800	1964	8.11	2501	5.68												

CFM	OV	STATIC PRESSURE (INCHES W.G.)															
		4.5"		5.0"		5.5"		6.0"		6.5"		7.0"		7.5"		8.0"	
		RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
5607	700	1613	6.60	1684	7.40	1754	8.21	1821	9.05	1886	9.92	1949	10.80				
6408	800	1659	7.44	1728	8.31	1795	9.18	1859	10.08	1921	10.98	1982	11.91				
7209	900	1711	8.33	1778	9.27	1842	10.21	1905	11.18	1965	12.16						
8010	1000	1770	9.28	1833	10.30	1895	11.32	1955	12.35								
8811	1100	1836	10.29	1895	11.38	1953	12.48										
9612	1200	1907	11.37	1963	12.53												
10413	1300	1981	12.53														

Model CBDF Inline Centrifugal Fan, Belt Driven

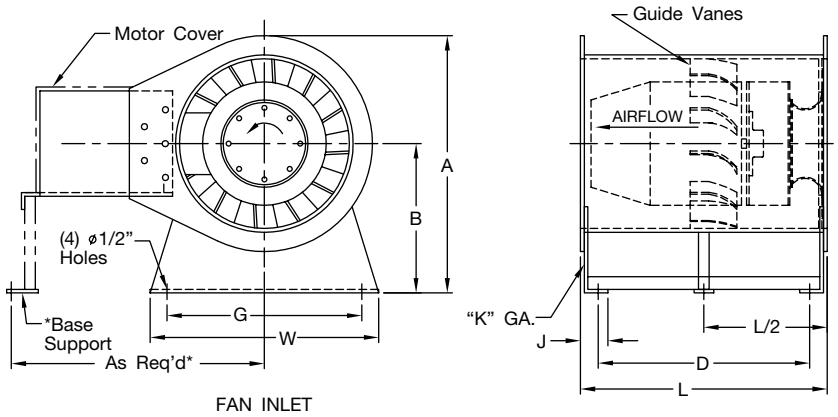


FAN SIZE	OUTLET AREA (FT2)	A	B	C	E	F	L	MAX MOTOR FRAME
12	1.80	21.50	29.13	18.19	0.38	0.19	24.00	213T
16	2.68	25.50	31.63	22.19	0.38	0.19	28.00	213T
20	4.67	33.25	42.75	29.25	0.38	0.25	36.00	286T
25	8.01	42.31	49.25	38.31	0.38	0.31	44.00	324T

NOTE:
1. Dimensions are not to be used for construction.

1005858

Model CBDF Inline Centrifugal Fan with Horizontal Support Legs, Belt Driven



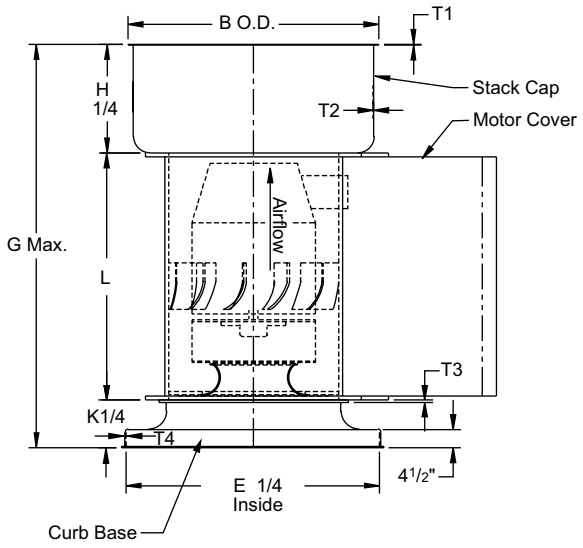
*AS REQ'D ON SIZE 20 OR LARGER

FAN SIZE	A	B	D	G	J	K Ga.	L	W
12	25.50	14.75	21.50	19.50	1.88	10.00	24.00	21.00
16	29.50	16.75	25.50	23.50	2.38	10.00	28.00	25.50
20	37.25	20.63	32.06	31.00	3.38	0.19	36.00	34.00
25	46.31	25.13	40.06	39.00	3.38	0.19	44.00	42.00

NOTE:
1. Dimensions are not to be used for construction.

1005866

Model CBDF Inline Centrifugal Roof Ventilator, Belt Driven



Minimum outlet velocity required for full open damper operation is 1500 FPM.

SD = Fan Shaft Diameter

FAN SIZE	B	E	SD	G	H	K	L	T1	T2	T3	T4
12	24.25	29.88	1.38	40.75	8.00	8.00	24.00	0.25	0.09	0.38	0.19
16	29.50	33.81	1.50	47.38	11.00	7.63	28.00	0.25	0.13	0.38	0.19
20	37.25	43.81	1.50	59.25	14.00	8.50	36.00	0.25	0.13	0.38	0.19
25	46.50	51.81	1.50	75.00	19.00	11.25	44.00	0.25	0.13	0.50	0.25

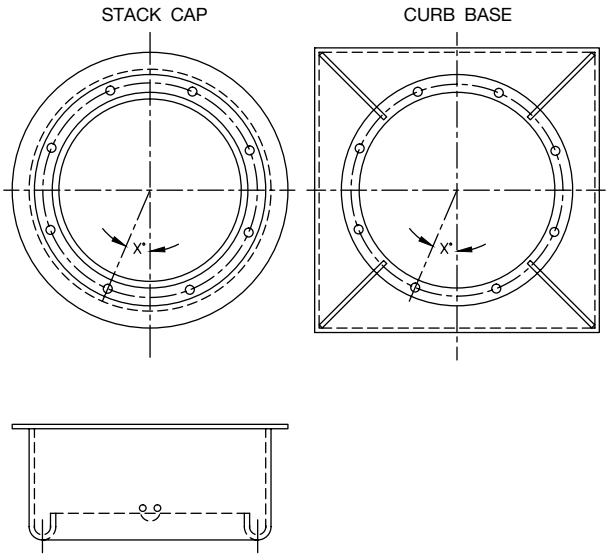
NOTE:
1. Dimensions are not to be used for construction.

1005859

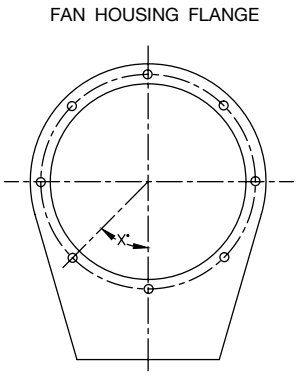
AEROVENT
INDUSTRIAL VENTILATION SYSTEMS

Fiberglass Punched Hole Pattern

ROOF VENTILATOR DRILLING



DUCT FAN DRILLING



Roof Ventilator Drilling

FAN SIZE	BOLT CIRCLE	HOLE SIZE	HOLE FLANGE	X°
12	20.38	0.31	8.00	22.50
16	24.25	0.31	8.00	22.50
20	32.00	0.44	8.00	22.50
25	41.00	0.44	8.00	22.50

D-24999

Duct Fan Drilling

FAN SIZE	BOLT CIRCLE	HOLE SIZE	HOLE FLANGE	X°
12	20.38	0.31	8.00	45.00
16	24.25	0.31	8.00	45.00
20	32.00	0.44	8.00	45.00
25	41.00	0.44	8.00	45.00

D-24999

NOTE:
1. Dimensions are not to be used for construction.

AEROVENT
INDUSTRIAL VENTILATION SYSTEMS

Model

CBDF

Fiberglass Inline Centrifugal Fans, where indicated on drawings and schedules, shall be Model CBDF belt driven fans as manufactured by Aerovent, Minneapolis, Minnesota and shall be of the size and capacity as indicated in the fan schedule. Model CBDF fans shall be tested in accordance with ANSI/ASHRAE 51-1985 and ANSI/AMCA 210-85 test codes and shall be guaranteed by the manufacturer to deliver at the rated published performance levels. In addition, each unit shall be factory run tested prior to shipment.

CONSTRUCTION — The fan housing shall be constructed of polyester resin reinforced with fiberglass cloth and mat with integral flanges. The flanges are designed to ensure housing concentricity, housing strength and to permit duct mounting. Tapered gussets interlocked into the outer housing shall support the bearing base and drive enclosure. Straightening vanes constructed of laminated glass and resin shall be interconnected to the inner and outer shell. A Viton type shaft seal and Teflon wear plate, to protect the shaft and bearings, shall be supplied as standard. The motor base shall be constructed of mild steel and bolted between gussets integral with the fan housing flanges. The motor base shall be finished with a gray air dried epoxy paint.

Bearings and belts are enclosed in an air insulated fiberglass housing to protect them from the airstream gases, fumes and vapors.

IMPELLER — The Model CBDF fiberglass non-overloading, backward inclined impeller shall be constructed using glass cloth impregnated with vinyl ester resin and shall be secured to a 316 stainless steel fan shaft with a stainless steel bolt. Impellers shall be statically and dynamically balanced to ensure quiet operation.

BEARINGS — Model CBDF belt driven fans shall be supplied with pillow block type bearings with lubrication lines extended to the outside of the fan housing for easy maintenance. Bearings shall have a minimum L-10 life as defined by AFBMA of at least 20,000 hours (100,000 hours average life). Bearings and belts shall be enclosed in an air-insulated fiberglass housing for protection.

DRIVE — All drive selections on Model CBDF belt driven fans shall be designed with a 1.4 service factor, unless otherwise specified. Sheaves shall be cast iron with static conducting belts. Belt adjustment shall be accomplished with an adjustable motor slide rail base.

MOTOR — Belt driven fan motors shall be NEMA Design B, standard industrial, continuous-duty, ball bearing, variable torque and shall be provided with the enclosure model, voltage, phase and hertz as listed in the fan schedule.

BALANCING — The impeller assembly shall be statically and dynamically balanced in accordance with ANSI/AMCA 204-96 “Balance Quality and Vibration Levels for Fans” to Fan Application Category BV-3, Balance Quality Grade G6.3. In addition, belt driven fan impellers shall be balanced on the fan shaft after final assembly in the fan casing, in the manufacturing facility, to the following peak velocity values, filter-in, at the fan test speed:

Fan Application Category	Rigidly Mounted (in./s)	Flexibly Mounted (in./s)
BV-3	0.15	0.20

FINISH — All steel parts shall be finished with a gray air dried epoxy paint. All fiberglass parts shall be coated inside and outside with resin (with UV inhibitor), approximately 10 mils in thickness, to seal the surface and provide a smooth, shiny finish. Optional resins and finishes include: Vinyl Ester, Surface Veil, Silica Sand and Fire-Retardant Resin.

SOUND POWER LEVELS — The sound power level of the fan(s) shall not exceed:

Octave Band-CPS (Sound Power 10^{-12})

63	125	250	500	1000	2000	4000	8000

ACCESSORIES — The fan(s) shall be furnished complete with:

- Fiberglass Curb Cap
- Fiberglass Motor Cover
- Fiberglass Stack Cap
- Housing Drain
- Outlet Guard (304SS/316SS)
- Horizontal Support Legs
- Ceiling Suspension Brackets
- Exterior 316 Stainless Steel Hardware
- Stack Cap Bird Screen
- Bolted Inspection Door
- Inlet Guard (304SS/316SS)

WALL MOUNTED FANS | TUBEAXIAL & VANEAXIAL FANS | CENTRIFUGAL FANS & BLOWERS
ROOF VENTILATORS | AIR HEATERS & COOLERS | AIR MAKE-UP | FIBERGLASS FANS | CUSTOM FANS

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