

# Fiberglass Backward Utility Fans

Series 41U



# HARTZELL®

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

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# Series 41U Fiberglass Backward Curved Centrifugal Utility Fan



The Hartzell Series 41U Backward Curved Utility Fan can be used in most applications where corrosive elements exist in fume and vapor form. The backward curved centrifugal blower offers non-overloading efficiency and economy in corrosive atmospheres.

## Features

- **Sizes** – 12", 18", and 24" wheel diameters. SWSI only.
- **Arrangement** – 10, packaged unit only.
- **Performance** – 700 CFM to 10,300 CFM; static pressures to 6" W.G.
- **FRP Materials** – solid fiberglass wheel molded with Ashland Derakane 510-A vinyl ester resin. Other standard FRP components constructed of fiberglass and Ashland 693 resin. See Corrosion Resistance Guide on page 5 for resin characteristics and other resins.
- **Temperature Limitations** – suitable for temperatures up to 200°F.
- **Rotation and Discharge** – Clockwise or counterclockwise rotation in all eight discharge positions. Rotatable housing.
- **Wheel** – a high efficiency, one-piece, solid fiberglass, non-overloading backward curved, with single thickness airfoil blades. **Wheel Type FA.**
- **Shaft Seal** – a fiberglass and neoprene shaft seal is placed where the shaft leaves the housing along with a neoprene shaft slinger between the seal and wheel on belt drive units. Seal is not gas tight.
- **Drive Assembly** – Belts are oil, heat and static resistant type. Shafts are turned, ground and polished, keyed at both ends, fiberglass enclosed in the airstream.
- **Base** – epoxy coated hot rolled steel.
- **Easy installation and maintenance** – Motor, drive and bearings are readily accessible for ease in wiring, installation, adjustment and lubrication.
- **Fan inlets and outlets** – Straight inlet and outlet connections are provided for easy "slip-fit" connection to ducting.
- **Options and Accessories** – See page 4.



Hartzell Fan, Inc. certifies that the FRP Backward Curved Centrifugal Fan, Series 41U, shown hereon, is licensed to bear the AMCA Seal for Air and Sound. The ratings shown are based on tests and procedures performed in accordance with AMCA Publication 211 and AMCA Publication 311 and comply with the requirements of the AMCA Certified Ratings Program.

Sound performance data is available upon request. Please contact the factory and ask for Engineering Publication #SD-160.

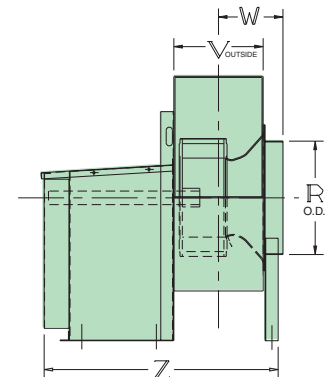
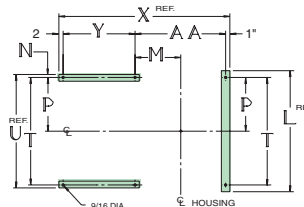
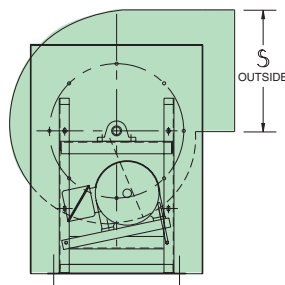
## Principal Dimensions (Inches)

Fan Size	A	B	C	D	E	F	G	H	J	K	L	M	N
12	18 <sup>1</sup> / <sub>16</sub>	13 <sup>1</sup> / <sub>8</sub>	13	11 <sup>1</sup> / <sub>2</sub>	12 <sup>1</sup> / <sub>4</sub>	18 <sup>1</sup> / <sub>2</sub>	10 <sup>3</sup> / <sub>4</sub>	10	9 <sup>1</sup> / <sub>4</sub>	5 <sup>5</sup> / <sub>16</sub>	21 <sup>1</sup> / <sub>2</sub>	7 <sup>7</sup> / <sub>16</sub>	3 <sup>3</sup> / <sub>4</sub>
18	23	19 <sup>3</sup> / <sub>4</sub>	19	17 <sup>1</sup> / <sub>4</sub>	18 <sup>7</sup> / <sub>16</sub>	27 <sup>7</sup> / <sub>16</sub>	16 <sup>3</sup> / <sub>16</sub>	15 <sup>1</sup> / <sub>16</sub>	13 <sup>15</sup> / <sub>16</sub>	4 <sup>1</sup> / <sub>4</sub>	27 <sup>3</sup> / <sub>4</sub>	9 <sup>7</sup> / <sub>8</sub>	1
24	29	26 <sup>1</sup> / <sub>8</sub>	23	22 <sup>15</sup> / <sub>16</sub>	24 <sup>7</sup> / <sub>16</sub>	34 <sup>3</sup> / <sub>4</sub>	21 <sup>1</sup> / <sub>2</sub>	20	18 <sup>1</sup> / <sub>2</sub>	5 <sup>5</sup> / <sub>8</sub>	30	12 <sup>3</sup> / <sub>16</sub>	1

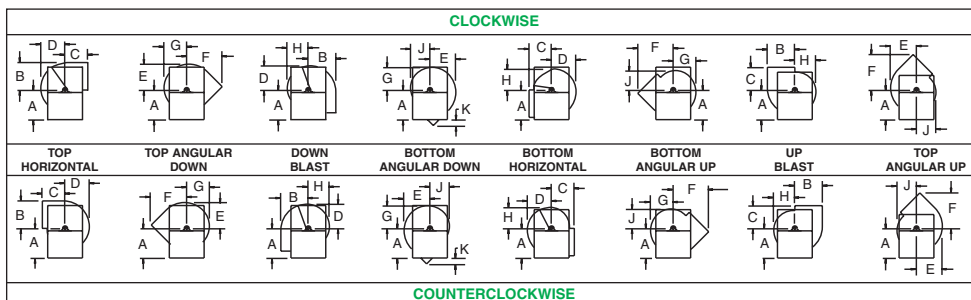
Fan Size	P	R	S	T	U	V	W	X	Y	Z	AA	Max. Motor Frame
12	9 <sup>7</sup> / <sub>8</sub>	12 <sup>1</sup> / <sub>4</sub>	13 <sup>1</sup> / <sub>8</sub>	19 <sup>3</sup> / <sub>4</sub>	21 <sup>1</sup> / <sub>4</sub>	9 <sup>9</sup> / <sub>16</sub>	8	28 <sup>5</sup> / <sub>8</sub>	12	32 <sup>5</sup> / <sub>8</sub>	13 <sup>9</sup> / <sub>16</sub>	182T
18	10 <sup>1</sup> / <sub>8</sub>	18 <sup>1</sup> / <sub>4</sub>	19 <sup>11</sup> / <sub>16</sub>	20 <sup>1</sup> / <sub>4</sub>	22 <sup>1</sup> / <sub>4</sub>	14 <sup>3</sup> / <sub>8</sub>	10 <sup>3</sup> / <sub>8</sub>	33 <sup>5</sup> / <sub>8</sub>	12	37 <sup>5</sup> / <sub>8</sub>	18 <sup>1</sup> / <sub>2</sub>	184T
24	10 <sup>1</sup> / <sub>8</sub>	24 <sup>1</sup> / <sub>4</sub>	26 <sup>1</sup> / <sub>8</sub>	20 <sup>1</sup> / <sub>4</sub>	22 <sup>1</sup> / <sub>4</sub>	19	12 <sup>3</sup> / <sub>4</sub>	38 <sup>5</sup> / <sub>16</sub>	12	42 <sup>5</sup> / <sub>16</sub>	23 <sup>3</sup> / <sub>16</sub>	213T

**ABS Certificate of Design Assessment Received**

Certificates of Design Assessment are issued by the American Bureau of Shipping. The assessment is a representation by the Bureau as to the degree of compliance the design exhibits with applicable sections of the Rules. The certificates, by itself, do not reflect that the products are Type Approved.



## Fan Discharges



Note: For angular and/or down blast, contact factory when discharge flanges are required.



# Performance Data, 100% Width

## A41U0-12-FA100FG

Outlet Area – 0.87 sq. ft.  
Wheel Diameter – 12.25 in.  
Wheel Circumference – 3.2 ft.

Volume	Outlet Velocity		½ "SP		1 "SP		1½ "SP		2 "SP		2½ "SP		3 "SP		3½ "SP		4 "SP		5 "SP		6 "SP	
	CFM	FPM	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
700	805	1190	0.09	1464	0.17	1707	0.26															
800	920	1279	0.12	1533	0.20	1759	0.30	1967	0.40	2162	0.52											
900	1034	1373	0.14	1609	0.23	1822	0.34	2017	0.45	2202	0.57	2377	0.70									
1000	1149	1471	0.17	1691	0.27	1892	0.38	2078	0.50	2252	0.62	2418	0.75	2578	0.90							
1100	1264	1568	0.21	1779	0.31	1969	0.43	2145	0.55	2311	0.68	2469	0.82	2621	0.96	2769	1.12					
1200	1379	1663	0.25	1873	0.36	2050	0.48	2219	0.61	2378	0.75	2529	0.89	2674	1.04	2814	1.20	3083	1.54			
1300	1494	1759	0.29	1968	0.42	2136	0.55	2297	0.68	2449	0.82	2594	0.97	2734	1.13	2868	1.29	3126	1.63	3372	2.01	
1400	1609	1857	0.34	2066	0.48	2228	0.62	2379	0.76	2526	0.91	2665	1.06	2799	1.22	2929	1.39	3177	1.74	3414	2.12	
1500	1724	1956	0.39	2164	0.55	2322	0.69	2466	0.84	2606	1.00	2740	1.16	2870	1.32	2995	1.50	3234	1.86	3462	2.24	
1600	1839	2058	0.46	2260	0.62	2418	0.78	2557	0.93	2690	1.09	2819	1.26	2945	1.43	3066	1.61	3297	1.98	3517	2.38	
1700	1954	2161	0.53	2355	0.70	2516	0.87	2651	1.03	2777	1.20	2902	1.37	3023	1.55	3140	1.74	3364	2.12	3578	2.53	
1800	2069	2266	0.61	2451	0.78	2614	0.97	2747	1.15	2869	1.32	2987	1.50	3104	1.68	3218	1.87	3436	2.27	3643	2.69	
1900	2184	2373	0.69	2548	0.88	2711	1.08	2843	1.26	2963	1.45	3077	1.63	3189	1.82	3298	2.02	3510	2.43	3712	2.86	
2000	2299	2480	0.79	2646	0.98	2806	1.19	2941	1.39	3059	1.58	3169	1.77	3276	1.97	3382	2.17	3588	2.60			
2100	2414	2589	0.90	2745	1.09	2901	1.31	3039	1.53	3155	1.73	3264	1.93	3367	2.13	3468	2.34	3668	2.78			
2200	2529	2698	1.02	2846	1.21	2997	1.44	3137	1.67	3253	1.89	3359	2.10	3461	2.31	3558	2.52	3751	2.97			
2300	2644	2807	1.14	2948	1.34	3094	1.57	3231	1.82	3351	2.05	3456	2.27	3556	2.49	3651	2.71					
2400	2759	2917	1.28	3052	1.48	3192	1.72	3326	1.97	3450	2.23	3554	2.46	3651	2.69	3745	2.92					

## A41U0-18-FA100FG

Outlet Area – 1.88 sq. ft.  
Wheel Diameter – 18.5 in.  
Wheel Circumference – 4.84 ft.

Volume	Outlet Velocity		½ "SP		1 "SP		1½ "SP		2 "SP		2½ "SP		3 "SP		3½ "SP		4 "SP		5 "SP		6 "SP	
	CFM	FPM	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
1600	851	773	0.19	944	0.34	1098	0.52	1247	0.72													
1800	957	824	0.23	985	0.40	1127	0.58	1263	0.78	1395	1.01											
2000	1064	878	0.28	1030	0.46	1164	0.65	1288	0.85	1410	1.08	1530	1.34									
2200	1170	932	0.33	1077	0.52	1206	0.73	1323	0.94	1435	1.17	1546	1.43	1655	1.70							
2400	1277	984	0.39	1127	0.60	1250	0.81	1362	1.04	1468	1.28	1570	1.54	1672	1.81	1773	2.11					
2600	1383	1033	0.44	1180	0.68	1296	0.91	1405	1.15	1506	1.41	1603	1.67	1697	1.94	1791	2.24	1976	2.89			
2800	1489	1085	0.51	1234	0.77	1345	1.01	1450	1.27	1548	1.54	1641	1.81	1730	2.09	1817	2.39	1992	3.04	2161	3.75	
3000	1596	1138	0.59	1288	0.87	1397	1.13	1496	1.40	1591	1.68	1681	1.97	1767	2.26	1851	2.57	2013	3.21	2176	3.93	
3200	1702	1193	0.67	1342	0.98	1450	1.26	1545	1.54	1637	1.83	1724	2.13	1808	2.44	1888	2.76	2043	3.41	2196	4.13	
3400	1809	1251	0.77	1392	1.09	1503	1.40	1596	1.69	1684	1.99	1769	2.31	1850	2.63	1928	2.96	2077	3.64	2221	4.36	
3600	1915	1311	0.87	1442	1.21	1557	1.55	1648	1.86	1733	2.17	1815	2.50	1894	2.83	1970	3.18	2115	3.88	2254	4.61	
3800	2021	1371	0.99	1493	1.34	1612	1.71	1702	2.03	1784	2.36	1863	2.70	1940	3.05	2014	3.41	2155	4.14			
4000	2128	1433	1.13	1544	1.47	1665	1.87	1756	2.22	1836	2.57	1912	2.91	1987	3.28	2059	3.65	2197	4.41			
4200	2234	1495	1.27	1597	1.62	1714	2.04	1810	2.43	1890	2.79	1964	3.15	2036	3.52	2106	3.90	2241	4.69			
4400	2340	1557	1.43	1652	1.78	1764	2.22	1864	2.64	1943	3.02	2017	3.40	2086	3.78	2154	4.17	2286	4.98			
4600	2447	1620	1.60	1708	1.96	1814	2.40	1918	2.86	1998	3.27	2070	3.66	2138	4.06	2204	4.46					
4800	2553	1684	1.79	1766	2.16	1866	2.60	1967	3.08	2052	3.53	2124	3.94	2191	4.35	2255	4.77					
5000	2660	1748	1.99	1826	2.37	1918	2.82	2017	3.31	2106	3.80	2178	4.24	2244	4.67							
5200	2766	1812	2.21	1886	2.60	1971	3.05	2067	3.56	2158	4.08	2232	4.54									
5400	2872	1876	2.45	1947	2.84	2026	3.29	2117	3.81	2208	4.36	2286	4.87									
5600	2979	1940	2.70	2009	3.11	2082	3.56	2169	4.09	2257	4.65											
5800	3085	2005	2.97	2071	3.39	2140	3.84	2222	4.38													

## A41U0-24-FA100FG

Outlet Area – 3.33 sq. ft.  
Wheel Diameter – 24.625 in.  
Wheel Circumference – 6.44 ft.

Volume	Outlet Velocity		½ "SP		1 "SP		1½ "SP		2 "SP		2½ "SP		3 "SP		3½ "SP		4 "SP		5 "SP		6 "SP	
	CFM	FPM	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
2800	841	559	0.31	691	0.57	816	0.87															
3300	991	601	0.39	730	0.69	838	1.00	944	1.36													
3800	1141	644	0.48	775	0.83	874	1.17	966	1.54	1058	1.95	1151	2.40									
4300	1291	698	0.61	820	0.98	917	1.37	1002	1.76	1084	2.18	1164	2.63	1247	3.12	1328	3.64					
4800	1441	756	0.76	860	1.15	963	1.59	1044	2.01	1120	2.45	1193	2.92	1265	3.41	1339	3.94	1485	5.08			
5300	1592	815	0.94	904	1.33	1008	1.82	1090	2.29	1162	2.77	1230	3.26	1297	3.76	1362	4.30	1495	5.45			
5800	1742	876	1.15	956	1.57	1047	2.07	1136	2.61	1207	3.11	1272	3.63	1335	4.17	1396	4.72	1516	5.88			
6300	1892	938	1.39	1012	1.84	1090	2.34	1178	2.92	1253	3.49	1317	4.05	1377	4.61	1435	5.19	1548	6.39			
6800	2042	1000	1.66	1070	2.15	1138	2.66	1218	3.25	1297	3.89	1363	4.50	1422	5.10	1478	5.70	1585	6.95			
7300	2192	1063	1.97	1130	2.50	1193	3.03	1261	3.62	1337	4.29	1409	4.98	1468	5.62	1523	6.26					
7800	2342	1126	2.32	1190	2.90	1249	3.46	1309	4.04	1378	4.72	1449	5.45	1515	6.18	1569	6.86					
8300	2492	1190	2.71	1251	3.33	1307	3.93	1363	4.54	1422	5.19	1489	5.95	1555	6.73							
8800	2643	1255	3.14	1313	3.81	1367	4.45	1419	5.08	1472	5.74	1532	6.49	1595	7.30							
9300	2793	1319	3.63	1375	4.33	1427	5.01	1476	5.68	1526	6.36	1577	7.08									
9800	2943	1384	4.16	1437	4.91	1488	5.63	1535	6.34	1582	7.05											
10300	3093	1450	4.75	1500	5.53	1549	6.31	1595	7.05													

Performance certified for installation Type D: ducted inlet/ducted outlet.  
Power ratings (BHP) excludes transmission losses.  
Performance data is based on standard air conditions (0.075 #/ft³).  
Performance ratings do not include the effects of appurtenances (accessories).



# Options and Accessories

## Drain

Fiberglass half coupling assembled in housing, 1" NPT female threaded fitting.



## Combination Drive Guard and Weather Cover

Covers motor and shaft sheaves as well as belts. Combines guarding of the drive as well as protection from the weather. Arrangement 10.

## Inlet and Outlet Guards

Spiral ring guard offers protection on inlet side and a wire mesh guard can be furnished for the outlet side. Guards are alphascoat coated steel.

## Flanged Outlet

Bolt-on flanges. Drilled flanges can be furnished, if specified.

## Discharge Backdraft Damper

Automatic gravity operated backdraft damper eliminates backflow of air when fan is not operating.

## Vibration Isolator Rails

Rubber-in-shear or spring-type isolator rails available on all models.

## Hartzell Model Code

**A 4 1 U 0 - 18 - F A 1 0 0 F G O P J 3**

Type \_\_\_\_\_  
 A – Production Item  
 S – Stock Item  
 Q – Special Quote

Product Series \_\_\_\_\_

Arrangement (centrifugals only) \_\_\_\_\_

Size (nominal wheel diameter, inches) \_\_\_\_\_

Class \_\_\_\_\_

Wheel Code \_\_\_\_\_

Wheel Width (entries represent percents) \_\_\_\_\_

Material of Construction \_\_\_\_\_

Motor Enclosure \_\_\_\_\_

Motor Horsepower \_\_\_\_\_

Motor RPM/Phase \_\_\_\_\_

Motor RPM/Phase	
3 Phase	1 Phase
2 = 3450	B = 3450
3 = 1750	C = 1750
4 = 1140	D = 1140
5 = 870	E = 870
6 = 690	F = 690
7 = 575	G = 575

## Motor Horsepower

Horsepower	1/4	1/3	1/2	3/4	1	1 1/2	2	3	5	7 1/2	10	15	20	25	30	40	50	60	75	100	125	150	200
Code Letter	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z

## EXAMPLE:

Assume a performance of 3000 CFM at 3" S.P.W.G., at standard conditions, is required. Reading the table on page 3, we find a series 41U Fiberglass Backward Curved Centrifugal Utility Fan, size 18", will deliver that performance at 1681 fan RPM and 1.97 BHP. Looking at the model code above, we specify the fan series, Arrangement 10 (0=10), type FG wheel, fiberglass material of construction, with an Open Protected, 1.15 S.F. motor, 2 HP, 1750 RPM, 3 phase.

## 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.

## General Construction Options

### Abrasive/Erosive Resistant Coating

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

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

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

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 reinforced with a layer of surfacing veil. An additional final coat of resin will be applied for extra corrosion resistance.

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

### Electrostatically Grounded Fiberglass Fans

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

# Corrosion Resistance Guide

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

Environment	Hetron 693 Ashland F.	Hetron FR992 Ashland F.	510A Ashland F.	Environment	Hetron 693 Ashland F.	Hetron FR992 Ashland F.	510A Ashland F.	Environment	Hetron 693 Ashland F.	Hetron FR992 Ashland F.	510A Ashland F.
<b>ACIDS</b>				<b>ALKALIES (Synthetic Veil)</b>				<b>SALTS (cont'd.)</b>			
Acetic to 10%	180	200	210	Ammonium Bicarbonate to 50%	140.00	\$170	160.00	Sodium Ferricyanide	220.00	220.00	210.00
Acetic to 50%	90	160	180	Ammonium Carbonate	120.00	\$140	150.00	Sodium Fluoride	–	\$180	\$180
Acetic to 100%	–	NR	NR	Ammonium Hydroxide to 5%	\$90	\$180	\$180	Sodium Nitrate	220.00	220.00	210.00
Acrylic to 25%	–	100	100	Ammonium Hydroxide to 10%	\$90	\$170	\$150	Sodium Nitrite	–	220.00	NR
Benzene Sulfonic to 25%	180	210	150	Ammonium Hydroxide to 29%	NR	\$100	\$100	Sodium Silicate PH less than 1	160.00	210.00	NR
Benzene Sulfonic 25% up	90	210	NR	Barium Carbonate	180.00	\$240	210.00	Sodium Sulfate	180.00	240.00	210.00
Benzoic	250	220	210	Barium Hydroxide to 10%	–	\$170	150.00	Sodium Sulfite	–	220.00	210.00
Boric	180	220	210	Calcium Hydroxide to 15%	160.00	\$210	\$180	Stannic Chloride	*180	*220	*210
Butyric to 50%	150	150	210	Magnesium Carbonate	160.00	\$210	180.00	Stannous Chloride	*200	*220	*210
Butyric 50% up	–	100	80	Potassium Bicarbonate to 10%	90.00	\$170	\$150	Zinc Chloride	200.00	*220	*210
Carbonic	160	220	NR	Potassium Carbonate to 10%	90.00	\$180	\$150	Zinc Nitrate	180.00	220.00	210.00
Chloroacetic to 25%	NR	*180	*150	Potassium Hydroxide to 25%	NR	\$120	\$150	Zinc Sulfite	150.00	220.00	NR
Chloroacetic 25% to 50%	NR	*150	*120	Sodium Bicarbonate to 10%	140.00	\$210	\$180				
Chromic to 5%	100	110	150	Sodium Carbonate to 35%	90.00	\$180	\$180	<b>SOLVENTS</b>			
Chromic to 10% to 20%	–	NR	150	Sodium Hydroxide to 10%	NR	\$160	\$180	Acetone to 10%	NR	180.00	180.00
Citic	*200	*220	*210	Sodium Hydroxide to 25%	NR	\$160	\$180	Benzene	90.00	80.00	NR
Fluoboric	*\$90	*\$220	*\$210	Sodium Sulfide	90.00	\$220	\$210	Carbon Disulfide	NR	NR	NR
Gluosilicic up to 10%	\$100	\$150	\$180	Trisodium Phosphate to 50%	–	\$175	210.00	Carbon Tetrachloride	90 VAPOR	110.00	150.00
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	160.00	240.00	210.00	Ethylene Dibromide	NR	NR	NR
Hydrocyanic to 10%	200	170	210	Aluminum Sulfate	250.00	240.00	210.00	Ethylene Glycol	250.00	220.00	210.00
Hydrofluoric to 10%	***\$100	***\$150	***\$150	Ammonium Chloride	*200	*220	*210	n-Heptane	120.00	210.00	210.00
Hydrofluorosilicic up to 10%	*\$100	*\$150	*\$180	Ammonium Nitrate	200.00	220.00	220.00	Hexane	–	150.00	160.00
Hypochlorous to 20%	90	110	NR	Ammonium Persulfate	150.00	200.00	180.00	Methyl Ethyl Ketone to 10%	NR	80.00	NR
Lactic	*200	*220	*210	Ammonium Persulfate, saturate	150.00	NR	NR	Naphtha	200.00	210.00	180.00
Maleic	170	210	210	Ammonium Sulfate	200.00	220.00	220.00	Naphthalene	130.00	220.00	210.00
Nitric to 5%	200	170	150	Aniline Sulfate to 25%	150.00	220.00	210.00	Tetrachloroethylene	NR	100.00	80.00
Nitric 5% to 20%	–	140	120	Aniline Sulfate, saturated	150.00	220.00	NR	Toluene	90.00	NR	80.00
Oleic	200	220	210	Barium Chloride	200.00	240.00	210.00	Xylene	90.00	80.00	80.00
Oxalic	*220	*220	*210	Barium Sulfide	NR	\$210	180.00				
Perchloric to 10%	H&D	**150	**150	Calcium Chlorate	180.00	220.00	220.00	<b>BLEACHES</b>			
Phosphoric	*220	*\$210	*\$210	Calcium Chloride	250.00	240.00	220.00	Calcium Chlorate	180.00	220.00	220.00
Phosphoric, super	–	*\$210	*\$210	Calcium Sulfate	*200	*240	*210	Calcium Hypochlorite	100.00	NR	\$160
Phthalic Anhydride	*150	*210	*210	Copper Chloride	*250	*220	*220	Chlorine Dioxide up to 15%	–	160.00	*200
Picric to 10%	100	170	NR	Copper Cyanide	90.00	\$220	210.00	Chlorine Water	*125	*210	*200
Silicic	–	220	NR	Copper Fluoride	NR	\$170	NR	Hydrogen Peroxide to 30%	120.00	100.00	150.00
Stearic	200	220	210	Copper Sulfate	250.00	240.00	210.00	Sodium Chlorate	90.00	210.00	210.00
Sulfamic to 25%	160	150	NR	Ferric Chloride	*250	*220	*210	Sodium Hypochlorite to 15%	NR	125.00	\$180
Sulfuric to 25%	*200	*220	*210	Ferric Nitrate	170.00	220.00	210.00				
Sulfuric to 50%	*200	*200	*180	Ferric Sulfate	200.00	220.00	210.00	<b>OTHERS</b>			
Sulfuric to 70%	*150	*180	*100	Ferrous Chloride	*220	*220	*210	Alum. Chlorohydroxide to 50%	–	220.00	210.00
Sulfuric to 80%	NR	80	NR	Ferrous Nitrate	160.00	220.00	210.00	Ammonium Phosphate	150.00	210.00	210.00
Sulfurous to 10%	90	110	120	Ferrous Sulfate	220.00	220.00	210.00	Aqua Rega	NR	*80	NR
Tannic	200	220	210	Lead Acetate	160.00	220.00	210.00	Detergents	120.00	170.00	150.00
Tartaric	220	220	210	Magnesium Chloride	220.00	240.00	210.00	Glycerine	200.00	220.00	210.00
Trichloroacetic to 50%	*90	*220	*200	Magnesium Hydroxide	–	\$210	210.00	Kerosene	120.00	210.00	180.00
				Magnesium Sulfate	200.00	210.00	210.00	Photographic Solutions	–	80.00	NR
<b>ALCOHOLS</b>				Mercuric Chloride	*210	*220	*210	Perchloroethylene	NR	100.00	80.00
Amyl	200	210	120	Mercurous Chloride	210.00	220.00	210.00	Sodium Tetraborate	180.00	\$210	180.00
Benzyl	NR	100	NR	Nickel Chloride	220.00	220.00	210.00	Sodium Tripolyphosphate	125.00	210.00	210.00
Butyl	190	150	120	Nickel Nitrate	220.00	220.00	210.00	Sodium Xylene Sulfonate	–	170.00	160.00
Ethyl	90	120	80	Nickel Sulfate	220.00	220.00	210.00	Sorbitol Solutions	180.00	220.00	160.00
Methyl	90	80	NR	Potassium Chloride	200.00	240.00	210.00	Urea	90.00	170.00	150.00
				Potassium Dichromate	200.00	220.00	210.00	Urea-Ammonium-Nitrate	–	120.00	120.00
<b>GASES AND VAPORS</b>				Potassium Ferricyanide	200.00	220.00	210.00	Fertilizer Fumes	100.00	120.00	150.00
Ammonia, Dry	90	170	100	Potassium Nitrate	200.00	220.00	210.00	Shell-D-D	NR	100.00	NR
Ammonia, Wet	90	NR	NR	Potassium Permanganate	150.00	210.00	210.00	Steam Vapor	180.00	210.00	180.00
Bromine, Wet	90	*100	NR	Potassium Persulfate	90.00	220.00	210.00				
Carbon Dioxide	250	250	250	Potassium Sulfate	200.00	240.00	210.00				
Carbon Monoxide	200	250	250	Silver Nitrate	200.00	220.00	210.00				
Chlorine, Dry	*200	*210	NR	Sodium Acetate	150.00	220.00	210.00				
Florine	–	NR	80	Sodium Bisulfate	200.00	220.00	210.00				
Hydrogen Fluoride, Vapor	*90	*\$180	*\$180	Sodium Chloride	200.00	240.00	180.00				
Hydrogen Sulfide to 5%	250	240	180	Sodium Chlorite to 10%	175.00	170.00	150.00				
Sulfur Dioxide, Dry	200	250	210	Sodium Cyanide	100.00	220.00	210.00				
Sulfur Dioxide, Wet	200	250	210	Sodium Dichromate	160.00	220.00	210.00				
Sulfur Trioxide, Wet	–	220	210								

Reference  
C.R.G.13

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

\* Special shaft and hardware required, contact factory.

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

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

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

Hydrocarbon fuel environments may require static grounding, contact factory.

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



# Hartzell 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.

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HARTZELL DOES NOT WARRANT THAT SAID GOODS ARE OF MERCHANTABILITY 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



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Duct Fans



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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.