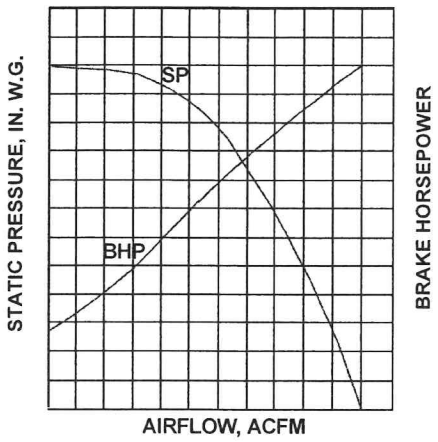
SELECTION PROCEDURE



FAN PERFORMANCE CURVE

The performance ratings shown in this catalog may be used to select a fan for your specific application. In order to properly use these ratings to select a fan, keep in mind the following:

1. The ratings are based on standard air, which means 68 deg. F., 50% R.H., 29.52"Hg and 0.075 lb./cu.ft. or 20 deg. C, 50% R.H., 101.3 kPa and 1.2 kg/m³ in SI units.

2. The tests on which the ratings are based are conducted with ducted inlets and outlets. The tests do not account for losses caused by variable inlets vanes, outlet dampers, inlet screens, V-belt drives, or unusual duct configurations.

By following the itemized procedure listed here, all necessary factors for the correct selection of the fan can be made easily and accurately in order to achieve the desired performance in the field.

1. Determine the amount of air required from your system design calculation. The elevation and air temperature must also be known.

2. From available duct design procedures, calculate the resistance of the duct system in ins. w.g. This is the system static pressure.

3. To select fans at a density other than .075 lb/cu. ft. or 1.2 kg/m³, a correction must be made both before and after selection, as follows:

a. For the given temperature and elevation, select the factor from Figure 1 on Page 3.

b. Divide the actual static pressure by the density correction factor to obtain the equivalent system static pressure at standard density.

Note: The CFM does not change with density.

4. The next step is to select the fan size. Since the value of losses cannot be assessed until the final size is determined, it is necessary to use the equivalent static pressure as an initial guide to the approximate operating point. In most cases several fan sizes can be chosen for any given performance, depending on whether low first cost, low energy consumption, low sound level, duct design velocity or space limitation is most important.

5. Having selected the fan size, calculate the losses due to the accessories.

a. For variable inlet vanes and outlet dampers, enter Figures 2 and 3 on pages 3 and 4 at the outlet velocity of the chosen fan and read the pressure losses at standard density.

b. For accessories such as silencers, flex connectors, etc., consult the supplier.

6. The effect of unusual inlet and outlet conditions on the fan performance can be calculated from AMCA Publication No. 201. These effects are then added as losses (in ins. w.g. at standard density) to equivalent static pressure. These losses are known as System Effect Factors. (SEF).

7. Add all accessory losses and SEF losses to the system fan static pressure at standard density to obtain the equivalent selection static pressure. Reenter the multi-rating tables for the chosen fan size with the equivalent selection static pressure and the required CFM.

8. Determine the fan speed at the intersection of the CFM and the equivalent selection static pressure values. Interpolate if necessary.

9. Read the fan BHP at this same intersection point, again interpolate as required.

10. Add the drive loss BHP from Figure 4 on page 4 to the BHP obtained from the tables to obtain the overall fan BHP at standard density. This overall BHP mist be multiplied by the density correction factor obtained in step 3(a) to give the fan BHP site conditions.

Using the above procedures, the fan will deliver the air volume and required system static pressure at the calculated speed and BHP.

As a final step, always check to be sure operating temperature does not reduce maximum allowable fan speed below selected speed.

DFC

Density Correction Factors

Density varies directly with Barometric pressure and inversely with absolute temperature and altitude. For example, if base density is .075 (70 deg F and S. L.) density at 200 deg. F and 2500 ft. elevation equals .055 (.075 x .733).

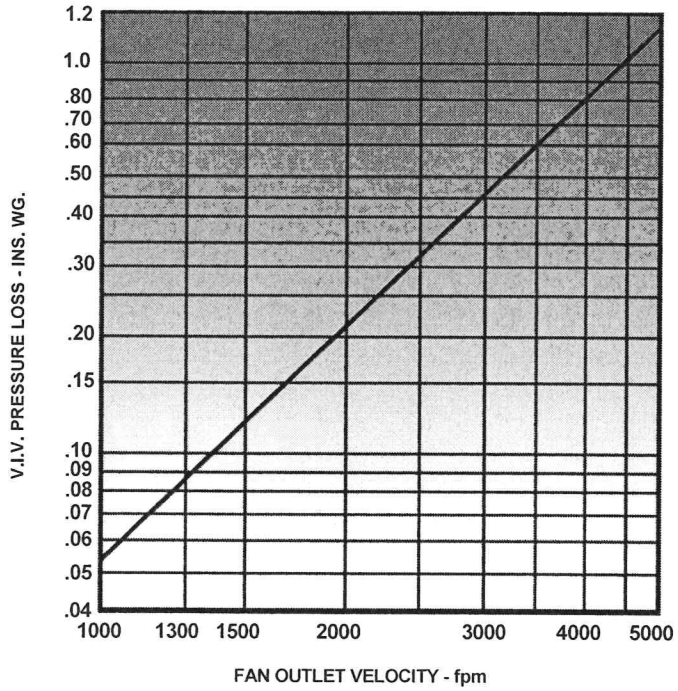
Figure 1. Density Correction Factors

DENSITY CORRECTION FACTORS FOR TEMPERATURE AND ELEVATION													
	ELEVATION IN FEET ABOVE SEA LEVEL												
AIR TEMP	SEA LEVEL	1000	1500	2000	2500	3000	4000	5000	6000	7000	8000	9000	10000
	BAROMETRIC PRESSURE IN INCHES OF MERCURY												
°F	**29.92**	**28.85**	**28.33**	**27.82**	**27.31**	**26.81**	**25.84**	**24.89**	**23.98**	**23.09**	**22.12**	**21.38**	**20.54**
-30	1.234	1.191	1.170	1.150	1.128	1.105	1.060	1.028	0.956	0.956	0.914	0.883	0.847
0	1.152	1.110	1.092	1.072	1.052	1.033	0.950	0.957	0.894	0.894	0.852	0.823	0.791
30	1.082	1.043	1.024	1.005	0.990	0.970	0.934	0.900	0.838	0.838	0.800	0.774	0.742
70	1.000	0.965	0.947	0.930	0.913	0.896	0.864	0.832	0.774	0.774	0.739	0.715	0.687
100	0.946	0.912	0.895	0.878	0.863	0.847	0.816	0.785	0.732	0.732	0.698	0.675	0.649
150	0.869	0.838	0.824	0.807	0.793	0.779	0.750	0.722	0.672	0.672	0.642	0.622	0.596
200	0.803	0.772	0.760	0.747	0.733	0.720	0.693	0.667	0.622	0.622	0.593	0.574	0.552
250	0.747	0.720	0.707	0.695	0.682	0.670	0.645	0.622	0.578	0.578	0.552	0.535	0.512
300	0.697	0.672	0.660	0.647	0.636	0.625	0.602	0.579	0.540	0.540	0.515	0.498	0.478
350	0.654	0.630	0.620	0.608	0.597	0.586	0.564	0.543	0.507	0.507	0.483	0.467	0.449
400	0.616	0.594	0.583	0.572	0.562	0.552	0.532	0.512	0.477	0.477	0.455	0.440	0.423
500	0.553	0.534	0.524	0.514	0.505	0.496	0.478	0.460	0.428	0.428	0.409	0.396	0.380
600	0.500	0.482	0.474	0.474	0.456	0.448	0.432	0.416	0.387	0.387	0.370	0.358	0.344
700	0.457	0.441	0.433	0.433	0.417	0.410	0.395	0.380	0.354	0.354	0.338	0.327	0.314

V.I.V. Losses

Due to the restriction of air flow caused by the vanes in the wide open position, a correction to the fan performance obtained from the rating tables must be made. V.I.V. losses are related to the outlet velocity as shown on the chart. Determine the fan outlet velocity, enter the chart at this value, and read off the fully open V.I.V. loss. Add this loss to the required system static pressure corrected to standard air conditions before entering the selection tables.

Figure 2. V.I.V. Losses



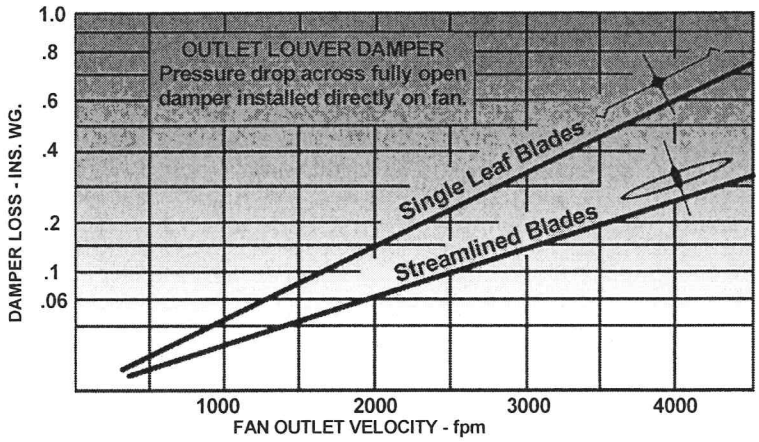
DFC

Outlet Damper

Due to resistance to the airflow caused by the outlet dampers in the wide open position, a correction to the fan performance obtained from the rating tables must be made. Outlet damper losses are added to the required static pressure before entering the selection tables, and are related to the fan outlet velocity as shown on the chart.

Fans are tested, and performance tabulated, without dampers. The DFC chart is an estimate of pressure drop through a typical opposed blade outlet damper at .075 lb/cu. ft. density.

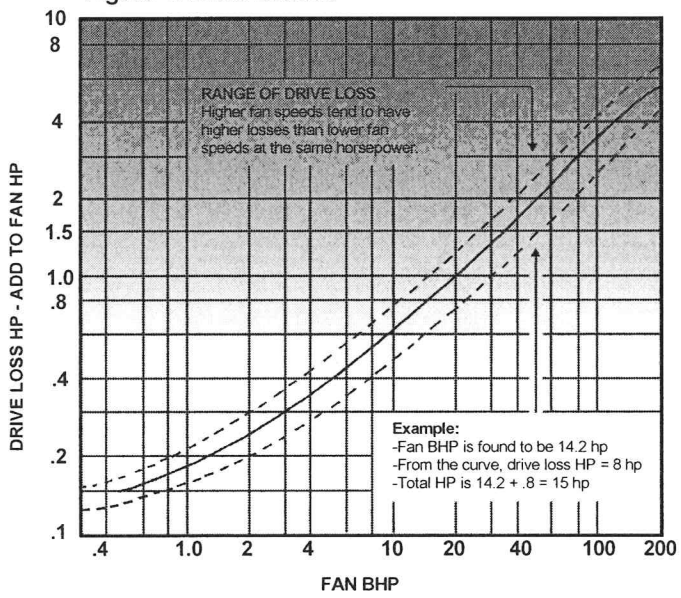
Figure 3. Damper Losses



Drive Losses

In common with most fan manufacturers, the rating tables shown in the catalog have been determined from tests on direct connected fans only. For any belt-driven fan application, an allowance for V-belt drive losses must therefore be added to the horsepower obtained from the rating tables as shown. The curve shown is adapted from AMCA Publication No. 203. It is based on tests and experience. However, some variation from these values may be expected.

Figure 4. Drive Losses



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