

How Temperature and Altitude can Affect your Blower?

Altitude and temperature have a direct effect on the system pressure and horsepower (hp) required to operate a blower. As air gets lighter (lower density) at higher temperatures, less work is required to move the air, resulting in lower horsepower being needed. When the air becomes heavier at lower temperatures, more power will be required. The density of the air affects the impeller's ability to move the air. For example, if a blower system was sized to operate at a flow of 500 CFM and a system design pressure of 50" H₂O, at 70 °F and sea level and the blower system was actually going to be used at an elevation of 6000 ft above sea level (FASL), the system pressure would have to be increased by a factor of 1.25, as shown in Table 2, as the air is less dense at these altitudes. Since the impeller's volumetric capacity doesn't change, the flow would remain the same at 500 CFM. If this same blower was to be operated at 100 °F, instead of 70 °F, a factor of 1.06 would need to be applied, as shown in Table 1.

Table 1: Correction for Temperature

Temp. F	Factor	Temp. F	Factor
-50	0.77	100	1.06
-25	0.82	120	1.09
0	0.87	140	1.13
20	0.91	160	1.17
40	0.94	180	1.21
60	0.98	200	1.25
70	1.00	225	1.29
80	1.02	250	1.34

Table 2: Correction for Altitude

Altitude	Factor	Altitude	Factor
0	1.00	5000	1.20
500	1.02	5500	1.22
1000	1.04	6000	1.25
1500	1.06	6500	1.27
2000	1.08	7000	1.30
2500	1.10	7500	1.32
3000	1.12	8000	1.35
3500	1.14	8500	1.37
4000	1.16	9000	1.40
4500	1.18	10000	1.45