AIRFLOW DEFINITIONS

All Star RBH Series blowers performance curves are based on scfm. Standard Cubic Feet per Minute of 14.7 psia, 68 deg F and 36% relative humidity conditions.

When a specification is using cfm for flow, it must be converted to scfm in order to utilize the regenerative blower performance curves. In addition to these two terms, other terms can be used as well. These are:

icfm (Inlet cubic feet per minute) The actual amount of air entering the blower inlet, which, at standard conditions, will be the same amount discharged. If actual conditions are different than SCFM above, a larger volume of air may be required.

acfm (Actual cubic feet per minute) Flow in cubic feet per minute measured at the actual pressure and temperature that exists at the specified reference point. The specified reference point can be defined anywhere in the system.

cfm (Cubic feet per minute) = icfm = acfm

When manufacturers list performance for blowers and compressors it is stated as "Capacity" in CFM (Cubic Feet per Minute). This refers to the volume of air at the inlet to the unit, therefore this is often referred to as Inlet CFM (ICFM) or Actual CFM (ACFM). These terms are used interchangeably and mean basically the same thing (CFM, ICFM, ACFM).

In many process applications there is a critical demand for a specific minimum flow in terms of some base or reference pressure, temperature and relative humidity. Many standards are used, the most common being the Compressed Air & Gas Institute (CAGI) and the American Society of Mechanical Engineers (ASME) standards, which are 14.7 PSIA, 68Deg. F and 36% relative humidity. When you express your "Demand" in Standard CFM (SCFM), you are saying that you want this compressor or blower to deliver this CFM even at your worst case conditions.

If you have a "DEMAND" of 500 SCFM and you pick a unit from the manufacturers literature that indicates a "CAPACITY" of 500 ACFM you will not get the amount of air that you require during times when your inlet conditions vary from the standard conditions. Corrections must be made to assure that the unit furnished will provide the proper amount of air for the process to function properly.

To convert your "DEMAND" SCFM to ACFM that you can use to select a unit from the manufacturers literature, you plug your standard conditions and the "worst case" inlet conditions (that will exist at the unit) into the formula shown below:

ACFM = SCFM x Ps-(RH s x PVs) x T a x Pb Pb – (RHa x PVa) Ts Pa

Where:

- Ps = Standard pressure (PSIA)
- Pb = Atmospheric pressure - barometer (PSIA)
- Pa = Actual pressure (PSIA)
- RH s = Standard relative humidity
- RHa = Actual relative humidity
- PVs = Saturated vapor pressure of water at standard temperature (PSI)
- PVa = Saturated vapor pressure of water at actual temperature (PSI)
- Ts = Standard temperature (DegeesR) Note: DegreesR=DegreesF + 460
- T a = Actual temperature (DegreesR)