36.8 $1000cfm$ **of** $350°F$, $80psia$ **air is supplied by an air compressor. What is the standard volume flow rate (SCFM)?**

A. $100cfm$

B. $300cfm$

C. $3500cfm$

D. $8500cfm$

Since the air being supplied is at an elevated temperature and pressure, it is necessary to make Temperature and Altitude Corrections for Air. This can be achieved using the factors in the table; however, the pressure is given in psia rather than as an elevation, therefore it is more straightforward to multiply by the ratio of the pressure as compared to standard atmosphereic pressure. Similarly, a temperature ratio multiplier is also convenient to use, provided absolute temperature units are used. Standard temperature and pressure may be considered $60°F$ and $14.7psia$.

In terms of qualitative expectations, a higher than standard pressure implies the standard CFM (SCFM) will be higher than the actual CFM. A higher than standard temperature implies the standard CFM will be lower than the actual CFM. In concept, SCFM is attempt to explain how much volume the compressor would move if pumping air at STP.

$$SCFM = (1000cfm)\left(\frac{80psia}{14.7psia}\right)\left(\frac{60°F + 460°R}{350°F + 460°R}\right) = 3,493cfm$$

Answer C