FAN AIR WORK & OVERALL FAN EFFICIENCY FORMULAE

- Fan Air Work Formula

$W_{fan} = Q \times P \times K$

Where,

W_{fan}: Fan air work in watt
Q: Airflow rate in cfm at AMCA standard atmospheric condition
P: Total pressure in inch water gauge
K: Conversion factor from Q x P to W_{fan}
$= 0.471947443 \times 10^{-3}$ m^3/s / cfm x 249.08891 N/m^2 / in-wg
= 0.1176 N-m/s / (cfm x in-wg) = 0.1176 W / (cfm x in-wg)

- Overall Fan Efficiency Formula

$F_{eff} = W_{fan} / W_{ctrin} \times 100$

Where,

F_{eff}: Overall fan efficiency in %

W_{ctrin}: Motor control electrical AC input in watt