

## Calculation of Energy Savings and Payback of High-Efficiency Motor

(Motor operating at 75% Full Load Rating)

Motor No. 1: STANDARD EFFICIENCY, 90.2% NEMA efficiency, cost \$859.50

$$\text{Input Power (kW)} = \frac{25\text{hp} \times 0.746 \times 75\%}{0.902 \text{ efficiency}} = 15.51 \text{ kW}$$

$$\text{Energy Usage (kWh)} = 15.51 \text{ kW} \times 6,000 \text{ hr.} = 93,060 \text{ kWh/yr}$$

Motor No. 2: PREMIUM EFFICIENCY, 93.6% NEMA efficiency, cost \$1,043.00

$$\text{Input Power (kW)} = \frac{25\text{hp} \times 0.746 \times 75\%}{0.936 \text{ efficiency}} = 14.94 \text{ kW}$$

$$\text{Energy Usage (kWh)} = 14.94 \text{ kW} \times 6,000 \text{ hr.} = 89,640 \text{ kWh/yr}$$

$$\text{Savings} = (93,060 - 89,640) = 3,420 \text{ kWh/yr}$$

		at \$0.09 per kWh	at \$0.07 per kWh
Value of Annual Savings		\$307.80	\$239.40
Simple Payback =	$\frac{\text{added cost } (\$183.50)}{\text{savings}}$	0.6 yr	0.8 yr