



ThermoAnalytics, Inc.

Mathcad Worksheet for Heat Rate Curve

$$\text{Mass} := 2000 \cdot \text{kg}$$

$$\text{Initial_Velocity} := 60 \cdot \frac{\text{mi}}{\text{hr}}$$

$$\text{Total_Vehicle_Energy} := \frac{1}{2} \cdot \text{Mass} \cdot \text{Initial_Velocity}^2$$

$$\text{Total_Vehicle_Energy} = 7 \times 10^5 \text{ J}$$

$$\text{Stopping_Time} := 6 \cdot \text{sec}$$

Assume front brakes perform 70% of total vehicle braking. 35% per front brake.

$$\text{Front_Wheel_Brake_Power} := 0.35 \cdot \frac{\text{Total_Vehicle_Energy}}{\text{Stopping_Time}}$$

$$\text{Front_Wheel_Brake_Power} = 56 \text{ hp}$$

$$\text{Front_Wheel_Brake_Power} = 42 \text{ kW}$$

$$\text{Front_Wheel_Brake_Power} = 1 \times 10^5 \frac{\text{BTU}}{\text{hr}}$$