**${LINE}:**

Insulate the side surface of the injection molding barrel with ${SIZEStr} in insulation blanket to reduce heat loss. The annual heat loss, Q1, can be estimated as:

Q${i} = h × C1 × A${i} × (ΔT${i}E – ΔT${i}P) × OH${i},

where

<single>h = Combined convective and radiative heat transfer coefficient, estimated to be 0.8 Btu/(hr·ft2·oF)[[1]](#footnote-1)

C1 = Conversion constant: 2.39×10-4 kW/(Btu/hr)</single>

A${i} = Estimated surface area (side) in line 1: ${SFA} ft2

ΔT${i}E = Existing temperature difference between surface and ambient air = ${TEMP}oF - ${AMB}oF

= ${TD}oF

ΔT${i}P = Proposed temperature difference between surface and ambient air after fully insulating the heater

= ${PTEMP}oF - ${AMB}oF

= ${PTD} oF

OH${i} = Hours per year operation: ${OH} hrs/yr (${HR} hrs/day, ${DY} days/wk, ${WK} wks/yr)

Thus,

Q${i} = 0.8 Btu/(hr·ft2·oF) × 2.93×10-4 kW/(Btu/hr) × ${SFA} ft2 × (${TD}oF - ${PTD}oF) × ${OH} hrs/yr

= ${AHL} kWh/yr.

1. Heat Transfer: A Practical Approach, by Yunus A. Cengel [↑](#footnote-ref-1)