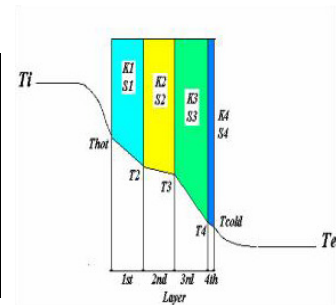


CALCULATION SHEET FOR TEMPERATURE DROP ACROSS REFRACTORY

1 Indicates cells that require user input.

1 Indicates cells that give the output.

Internal Temperature, T_i	1000	°C
External/Ambient Temperature, T_o	55	°C
Heat transfer coefficient for heat transfer inside, α_i	50	kcal/m ² h°C or W/m ² K
Heat transfer coefficient for heat transfer outside, α_o	16.29	kcal/m ² h°C or W/m ² K
Total resistance at internal surface, R_i	0.0200	m ² h°C/kcal or m ² K/W
Total resistance at outer surface, R_o	0.0614	m ² h°C/kcal or m ² K/W
Temperature at 1st refractory layer surface, $T_h = T_i - (q \times R_i)$	948	°C



Description	Unit	1st Refractory layer	2nd Refractory layer	3rd Refractory layer	Metal shell
Thickness, S	mm	80	0	0	8
Thermal conductivity, K	kcal/mh°C or W/mK	0.287	1	1	30.11
Thermal resistance, $R_n = S/(K \times 1000)$	m ² h°C/kcal or m ² K/W	0.2787	0	0	0.0003
Border layer Temperature, $T_n = T_{n-1} - (q \times R_n)$	°C	217	217	217	216
Temp drop across layer, $T_{n+1} - T_n$	°C	731	0	0	1

Total Thermal resistance, $R = R_i + R_1 + R_2 + R_3 + R_o$ **0.3604** m²h°C/kcal or m²K/W
 Heat flow (flux) density, $q = (T_i - T_o) / R$ **2622** kcal/m²h or W/m²

Diagramic representation of Ouput

