THE ACCESS PANEL COMPANY LTD

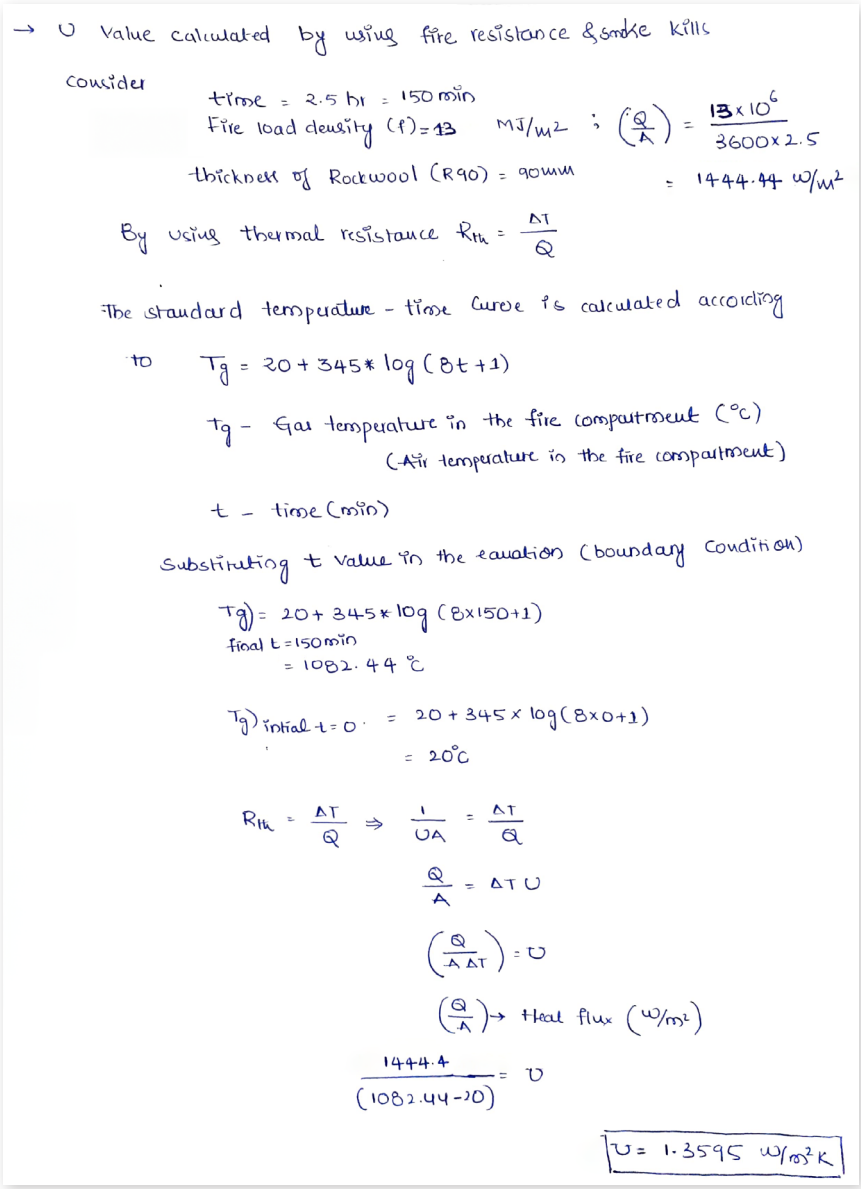
U-Value Calculation

Range 48: Christo Riser Doors
U-Value: 1.35 W/m²K

U-values allow us to measure how well a construction resists heat loss. We provide u-value calculations to show compliance with current Building Regulations / Standards and best practice.

The lower the u-value the better the level of insulation and more effective at preventing heat loss. Our access panels contain varing levels of insulation depending on their depth. Panels with a deeper profile can be fitted with more insulation resulting in a better u-value. The Christo Riser door incorporates 90mm of insulation in the door envelope which has a low lambda value which results in a low overall u-value of 1.35W/m²K.

Engineering Calculation



→ U Value calculated by using fire resistance & smoke kills

Consider

time = 2.5 hr = 150 min

Fire load density (f) = 13 MJ/m2 ; $\left(\frac{Q}{A}\right) = \frac{13 \times 10^6}{3600 \times 2.5}$

thickness of Rockwool (R90) = 90mm = 1444.44 w/m²

By using thermal resistance $R_{th} = \frac{\Delta T}{Q}$

The standard temperature - time curve is calculated according to $T_g = 20 + 345 * \log(8t + 1)$

T_g - Gas temperature in the fire compartment (°C)
(Air temperature in the fire compartment)

t - time (min)

Substituting t value in the equation (boundary condition)

$T_g = 20 + 345 * \log(8 \times 150 + 1)$

final t = 150 min
= 1082.44 °C

T_g initial t = 0 = $20 + 345 \times \log(8 \times 0 + 1)$
= 20°C

$R_{th} = \frac{\Delta T}{Q} \Rightarrow \frac{1}{UA} = \frac{\Delta T}{Q}$

$\frac{Q}{A} = \Delta T U$

$\left(\frac{Q}{A \Delta T}\right) = U$

$\left(\frac{Q}{A}\right)$ → Heat flux (w/m²)

$\frac{1444.4}{(1082.44 - 20)} = U$

U = 1.3595 w/m²K