3.4.1 SPRINT1 Cálculos

US404

1)

$$R\_c = \frac{1}{\frac{1}{Rporta} + \frac{1}{Rpardes}}$$

$$R\_porta = \frac{L}{kA} = \frac{0{,}1}{0{,}028 \times 0{,}7 \times 2{,}15} \approx 2{,}37\ K/W$$

$$A\_parede_c = 5 \times 4 \times 4 - (0{,}7 \times 2{,}15) = 78{,}495 m^2$$

$$R\_paredes = R\_parede1 + R\_parede2 + R\_parede3 = \frac{L1}{k1A} + \frac{L2}{k2A} + \frac{L3}{k3A} =$$

$$= \left(\frac{L1}{k1} + \frac{L2}{k2} + \frac{L3}{k3}\right) \times \frac{1}{A} = \left(\frac{0{,}05}{0{,}04} + \frac{0{,}04}{0{,}03} + \frac{0{,}06}{0{,}025}\right) \times \frac{1}{78{,}495} \approx 0{,}0635\ K/W$$

$$R_c = \frac{1}{\frac{1}{2{,}37} + \frac{1}{0{,}0635}} \approx 0{,}0618 K/W$$

2)

$$R\_d = \frac{1}{\frac{1}{Rporta} + \frac{1}{Rpardes}}$$

$$R\_porta = \frac{L}{kA} = \frac{0{,}1}{0{,}028 \times 0{,}7 \times 2{,}15} \approx 2{,}37\ K/W$$

$$A\_parede_d = 7 \times 5 \times 4 - (0{,}7 \times 2{,}15) = 98{,}495 m^2$$

$$R\_paredes = R\_parede1 + R\_parede2 + R\_parede3 = \frac{L1}{k1A} + \frac{L2}{k2A} + \frac{L3}{k3A} =$$

$$= \left(\frac{L1}{k1} + \frac{L2}{k2} + \frac{L3}{k3}\right) \times \frac{1}{A} = \left(\frac{0{,}05}{0{,}04} + \frac{0{,}04}{0{,}03} + \frac{0{,}06}{0{,}025}\right) \times \frac{1}{98{,}495} \approx 0{,}0506\ K/W$$

$$R_d = \frac{1}{\frac{1}{2{,}37} + \frac{1}{0{,}0506}} \approx 0{,}0495 K/W$$

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3)

$$R\_e = \frac{1}{\frac{1}{Rporta} + \frac{1}{Rpardes\_int} + \frac{1}{Rpardes\_ext}}$$

$$R\_porta = \frac{L}{kA} = \frac{0{,}1}{0{,}028 \times 0{,}7 \times 2{,}15} \approx 2{,}37\ K/W$$

$$A\_parede_{e\_int} = 10 \times 5 \times 2 - (0{,}7 \times 2{,}15) = 98{,}495 m^2$$

$$A_{parede_{e_{ext}}} = 10 \times 5 \times 2 = 100 m^2$$

$$R\_paredes\_int = R\_parede1 + R\_parede2 + R\_parede3 = \frac{L1}{k1A} + \frac{L2}{k2A} + \frac{L3}{k3A} =$$

$$= \left(\frac{L1}{k1} + \frac{L2}{k2} + \frac{L3}{k3}\right) \times \frac{1}{A} = \left(\frac{0{,}05}{0{,}04} + \frac{0{,}04}{0{,}03} + \frac{0{,}06}{0{,}025}\right) \times \frac{1}{98{,}495} \approx 0{,}0506\ K/W$$

$$R\_paredes\_ext = R\_parede1 + R\_parede2 + R\_parede3 = \frac{L1}{k1A} + \frac{L2}{k2A} + \frac{L3}{k3A} =$$

$$= \left(\frac{L1}{k1} + \frac{L2}{k2} + \frac{L3}{k3}\right) \times \frac{1}{A} = \left(\frac{0{,}25}{0{,}67} + \frac{0{,}10}{0{,}025} + \frac{0{,}05}{0{,}04}\right) \times \frac{1}{100} \approx 0{,}0562\ K/W$$

$$R_e = \frac{1}{\frac{1}{2{,}37} + \frac{1}{0{,}0506} + \frac{1}{0{,}0562}} \approx 0{,}0263\ K/W$$

3.4.1 SPRINT1 Cálculos

4)

$$R\_ext = \frac{1}{\frac{1}{R\_portas} + \frac{1}{R\_paredes} + \frac{1}{R\_janelas} + \frac{1}{R\_telhado}}$$

$$A_{portas} = (0{,}7 \times 2{,}15) \times 2 + 2{,}60 \times 4{,}50 = 14{,}71m^2$$

$$A_{janelas_{completa}} = (0{,}6 \times 0{,}8) \times 2 = 0{,}96m^2$$

Distancia topo do muro ao cume do telhado – h

$$h^2 = 5^2 + 1{,}35^2$$

$$h = 5{,}18$$

$$A_{Telhado} = (5{,}18 \times 20) \times 2 = 207{,}2m^2$$

$$A_{Triangulo} = \frac{(5 \times 1{,}35)}{2} = 3{,}375m^2$$

$$A_{paredes} = 20 \times 5 + 10 \times 5 - \left(A_{portas} + A_{janelas}\right) + A_{triangulo} \times 4$$

$$A_{paredes} = 150 - (14{,}71 + 0{,}96) + 3{,}375 \times 4$$

$$A_{Paredes} = 147{,}83m^2$$

$$R\_portas = \frac{L}{kA} = \frac{0{,}1}{0{,}028 \times 14{,}71} \approx 0{,}243\ K/W$$

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$$R_{janelas_{completas}} = \frac{1}{\frac{1}{R_{janelas_{vidro}}} + \frac{1}{R_{janelas_{PVC}}}}$$

$$A_{janelas_{vidro}} = (0{,}5 \times 0{,}7) \times 2 = 0{,}7m^2$$

$$A_{janelas_{PVC}} = (0{,}1 \times 0{,}5) \times 4 + (0{,}1 \times 0{,}8) \times 4 = 0{,}52m^2$$

$$R\_vidro = \frac{L}{kA} = \frac{0{,}03}{0{,}8 \times 0{,}7} \approx 0{,}0536\ K/W$$

$$R\_vidro = \frac{L}{kA} = \frac{0{,}1}{0{,}17 \times 0{,}52} \approx 1{,}1312\ K/W$$

$$R_{janelas_{completas}} = \frac{1}{\frac{1}{0{,}0536} + \frac{1}{1{,}1312}} \approx 0{,}0512\ K/W$$

$$R_{telhado} = R_{t1} + R_{t2} + R_{t3} = \frac{L1}{k1A} + \frac{L2}{k2A} + \frac{L3}{k3A} =$$

$$= \left(\frac{L1}{k1} + \frac{L2}{k2} + \frac{L3}{k3}\right) \times \frac{1}{A} = \left(\frac{0{,}1}{0{,}65} + \frac{0{,}10}{0{,}025} + \frac{0{,}05}{0{,}04}\right) \times \frac{1}{207{,}2} \approx 0{,}0261\ K/W$$

$$R_{paredes} = R_{parede1} + R_{parede2} + R_{parede3} = \frac{L1}{k1A} + \frac{L2}{k2A} + \frac{L3}{k3A} =$$

$$= \left(\frac{L1}{k1} + \frac{L2}{k2} + \frac{L3}{k3}\right) \times \frac{1}{A} = \left(\frac{0{,}25}{0{,}67} + \frac{0{,}10}{0{,}025} + \frac{0{,}05}{0{,}04}\right) \times \frac{1}{147{,}83} \approx 0{,}0380\ K/W$$

$$R_{ext} = \frac{1}{\frac{1}{0{,}243} + \frac{1}{0{,}0380} + \frac{1}{0{,}0512} + \frac{1}{0{,}0261}} \approx 0{,}0113\ K/W$$