

## {P 2.7}

$$P_{inf}=101330.$$

$$T_{sat\_inf}=T_{sat}(\text{Water}, P=P_{inf})$$

$$T_{cr\_w}=647.15$$

$$\sigma=0.238*(1-T_{sat\_inf}/T_{cr\_w})^{1.25}*(1.-0.639*(1.-T_{sat\_inf}/T_{cr\_w}))$$

$$\rho_f=\text{density}(\text{water}, P=P_{inf}, x=0.0)$$

$$\rho_g=\text{density}(\text{water}, P=P_{inf}, x=1.)$$

$$h_f=\text{enthalpy}(\text{Water}, P=P_{inf}, x=0.)$$

$$h_g=\text{enthalpy}(\text{Water}, P=P_{inf}, x=1.)$$

$$h_{fg}=h_g-h_f$$

## {R=1.e-6}

$$\text{DelT}_{sup}=2.*\sigma*T_{sat\_inf}/(R*h_{fg}*\rho_g)$$

$$\text{DelT}_{subc}=2.*\sigma*T_{sat\_inf}/(R*h_{fg}*\rho_f)$$

$$P_{inf} = 101330$$

$$T_{sat,inf} = T_{sat} [\text{water} , P = P_{inf} ]$$

$$T_{cr,w} = 647.15$$

$$\sigma = 0.238 \cdot \left[ 1 - \frac{T_{sat,inf}}{T_{cr,w}} \right]^{1.25} \cdot \left[ 1 - 0.639 \cdot \left( 1 - \frac{T_{sat,inf}}{T_{cr,w}} \right) \right]$$

$$\rho_f = \rho [\text{water} , P = P_{inf} , x = 0 ]$$

$$\rho_g = \rho [\text{water} , P = P_{inf} , x = 1 ]$$

$$h_f = h [\text{water} , P = P_{inf} , x = 0 ]$$

$$h_g = h [\text{water} , P = P_{inf} , x = 1 ]$$

$$h_{fg} = h_g - h_f$$

$$\text{DelT}_{sup} = 2 \cdot \sigma \cdot \frac{T_{sat,inf}}{R \cdot h_{fg} \cdot \rho_g}$$

$$\text{DelT}_{subc} = 2 \cdot \sigma \cdot \frac{T_{sat,inf}}{R \cdot h_{fg} \cdot \rho_f}$$

## SOLUTION

## Unit Settings: SI K Pa J mass deg

## (Table 1, Run 14)

$$\text{DelT}_{subc} = 0.0004092$$

$$h_f = 419073$$

$$h_g = 2.676\text{E}+06$$

$$R = 0.00005$$

$$\rho_g = 0.5975$$

$$T_{cr,w} = 647.2$$

$$\text{DelT}_{sup} = 0.6563$$

$$h_{fg} = 2.257\text{E}+06$$

$$P_{inf} = 101330$$

$$\rho_f = 958.4$$

$$\sigma = 0.05929$$

$$T_{sat,inf} = 373.2$$

5 potential unit problems were detected.

**Parametric Table: Table 1**

	<b>R</b>	<b>DelT<sub>sup</sub></b>
Run 1	1.000E-06	32.82
Run 2	0.000002	16.41
Run 3	0.000002	16.41
Run 4	0.000003	10.94
Run 5	0.000004	8.204
Run 6	0.000005	6.563
Run 7	0.000006	5.469
Run 8	0.000007	4.688
Run 9	0.000008	4.102
Run 10	0.000009	3.646
Run 11	0.00001	3.282
Run 12	0.00002	1.641
Run 13	0.00004	0.8204
Run 14	0.00005	0.6563