C.01.01.Z1 – Biblioteca Simplificada de Gás Ideal

Aplicação em FTHA – Finite Time Heat Addition Otto Engine Model

Prof. C. Naaktgeboren, PhD

https://github.com/CNThermSci/ApplThermSci

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Equação de Estado (EoS): Comportamento $P - T - v$

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Cada equação com forma nas bases mássica, e molar, com $R = \bar{R}/M$ — armazenar $\bar{R}$ e M!

Modelo de $\bar{c}_p(T)$ Polinomial:

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Armazenar a_i, T_{min} e T_{max} e saber as conversões (i) $a_i \to b_i$ e (ii) $\bar{c}_{p,v}(T) \to c_{p,v}(T)$.

Modelo de $\bar{c}_p(T)$ Polinomial: $\bar{u}(T)$

$$\bar{u}(T) = \int_{T_{ref}}^{T} \bar{c}_v(T)\, dT = \int_{T_{ref}}^{T} \sum_{i=1}^{4} b_i T^{i-1}\, dT, \qquad T_{min} \leqslant T \leqslant T_{max} \qquad \rightarrow$$

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- Armazenar T_{ref},
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Modelo de $\bar{c}_p(T)$ Polinomial: $\bar{h}(T) = \bar{u}(T) + \bar{R}T$

$$\bar{h}(T) = \int_{T_{ref}}^{T} \bar{c}_p(T)\,dT + \bar{R}T_{ref} = \int_{T_{ref}}^{T} \sum_{i=1}^{4} a_i T^{i-1}\,dT + \bar{R}T_{ref}, \quad T_{min} \leqslant T \leqslant T_{max} \qquad \rightarrow$$

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Modelo de $\bar{c}_p(T)$ Polinomial: $P_r(T)$ e $v_r(T)$

$$\left(\frac{P_2}{P_1}\right)_s = \frac{P_{r2}}{P_{r1}} \qquad \left(\frac{v_2}{v_1}\right)_s = \frac{v_{r2}}{v_{r1}}$$

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$$v_r(T) \equiv \frac{T}{P_r(T)}.$$

$$\left(\frac{v_2}{v_1}\right)_s = \frac{v_{r2}}{v_{r1}} \quad \rightharpoondown$$

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