JQ.8.5.Setup

November 16, 2014

8.5 A thick wood slab spreads a flame downward at 0.1 mm/s; the slab was initially at 20 C. If the slab were preheated to 100 C, what is the spread rate? Assume Tig=450C.

Setup The point of this question is to point out that the flame spread rate will be different if the initial temperature of the material changes. We are told that $V_p = 0.1mm/s$ when $T_o = 20^oC$. We are asked to find V_p when $T_o = 100^oC$. You can use either equation 8.23 or 8.25. Using Equation 8.23, think of this equation as:

$$V_p = \frac{C}{(T_{ig} - T_s)^2}$$

Find the material parameter C using the 20^oC case and then find V_p for the warmer case.

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