

# Heat Transfer Questions & Answers

## Question by Student 201527136

*Professor, I have a question about heat transfer in pipe. You said  $\Delta T_{lmtd}$  is almost same with  $T_w - \frac{1}{2}(T_{b,o} - T_{b,i})$  when  $\frac{T_w - T_{b,o}}{T_w - T_{b,i}} \geq 0.5$ . If  $T_{b,o}$  is not given, I can't judge  $\frac{T_w - T_{b,o}}{T_w - T_{b,i}} \geq 0.5$ . Then, do I have to use only  $\Delta T_{lmtd}$  instead of  $T_w - \frac{1}{2}(T_{b,o} - T_{b,i})$ ?*

Solve the problem and check if the simplified expression can be used or not. If it can not be used, re-solve the problem with the full expression.

## Question by Student 201428239

*Professor, I have a question about A8 of Q1. I need  $\mu$  to calculate Reynolds Number. In your lecture note of EG H-T in pipe, we used  $\mu$  at average bulk T. What happened if I use  $\mu$  at wall Temperature???* Does it cause wrong answer?

If you really want to know, you can try this in the quiz or exams and find out how many points you will lose.

## Question by Student 201900067

*Hello professor, I have a question about Assignment #8 question #4. In this question, it is said that pipe walls oppose negligible resistance to heat flow. However we must still consider the contact resistance between the pipe and the ground, if I'm not mistaken. The problem is that there is no indication about the material that makes up the pipe, so we shouldn't be able to use the tables to determine the contact resistance. In that case, can we neglect this resistance?*

If you can't find the resistance, then list in your assumptions you assume no resistance.

## Question by Student 201427129

*Professor, I have a question on assignment 8 for problem 4. To have shape factor of Isothermal cylinder of radius  $r$  buried in semi-infinite medium having isothermal surface, there are three shape factor. Each of them have restrictions. However, given values are  $D = 2m$ ,  $r = 0.15m$  and they satisfy the restriction in each case. Also, they have the same value, 191 m. which shape function should be chosen?*

Any one is fine as long as the conditions are satisfied.

#### **Question by Student 201312147**

*Professor, i have a question in table. In "Summary of convection correlations for internal flow in a circular tube of length  $L$  and diameter  $D$ ", What is the difference between "Fully-developed turbulent flow (smooth and rough tubes)" and "Fully-developed turbulent flow (rough tubes)"? One is "smooth and rough tubes" and the other is "rough tubes", but I don't know the difference.*

Well, as is written, one can be applied to either smooth and rough tubes, while the other can only be applied to rough tubes. Explain better what you don't understand.

#### **Question by Student 201542124**

*Professor, I have a question on assignment 8 for question 1. We don't know  $T_{b2}$  and only know  $T_{b1}$ . Should I assume average  $T = 343K$  because the wall temperature is  $344K$ , pipe is long compared to radius and it is fully developed flow?*

No, you have to follow the instructions associated with the correlation. If it's specified the properties need to be determined at the average bulk temperature, then you need to do so.