

ES 71- THE BUILDING ENVELOPE

Homework Assignment

- 1) Briefly describe what is meant by “surface film” resistance and why the interior surface film value is different from the exterior surface value.
- 2) Explain for different glazing types what the term “shading coefficient” means?
What are typical shading coefficients commonly found for:
 - Single pane clear glass
 - Single pane tinted glass
 - Single pane reflective glass
 - Dual pane tinted outside/clear inside
 - Dual pane reflective outside/clear inside
- 3) A 200 square foot composite building wall is comprised of the following components:
 - 30% windows; U value = 1.06; SC = 0.70
 - 20% hollow wood door; U = 0.46
 - 50% wall; wall is constructed of 6” lightweight concrete (resistance of 0.60 per inch of thickness) and R-11 insulation.
(Don’t forget to add surface film resistances!!)

If the inside temperature is desired to be maintained at 70F and the outside temperature is 15F; what is the heat transfer in Btu/hr for each component of the wall? What is the heat transfer for the entire wall?

- 4) What happens to the overall wall heat transfer rate if:
 - Solid core doors are used; U = 0.23
 - Double pane windows are used with overall U = 0.53