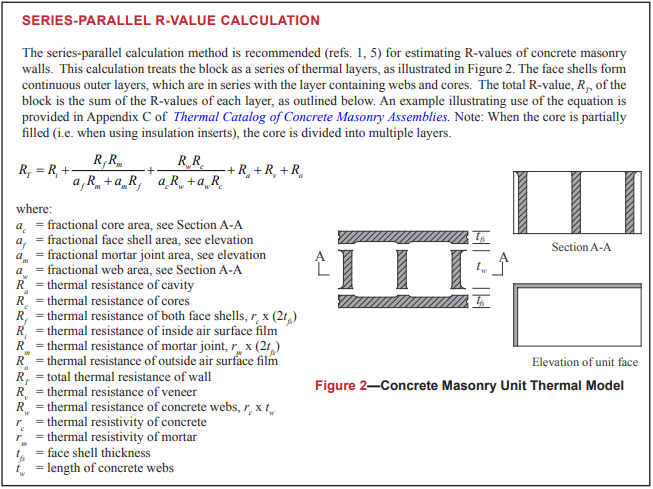
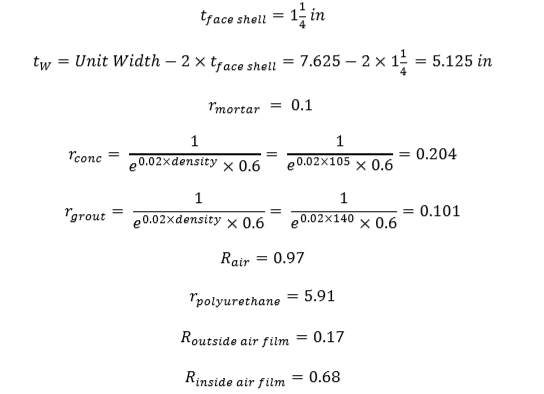
***Task:****Find the R-value and U-factor for a 3-web* ***fully******grouted*** *CMU block following a Series-Parallel R-Value Calculation. Assume: Assembly 1-1 – 8” x 8” x 16” 105 lb/ft3 with CMU Unit length = 15.625 in, Unit Width = 7.625 in, Unit Height = 7.625 in, Mortar Joint Thickness = 0.375 in, Thickness of Web = 1 in.*

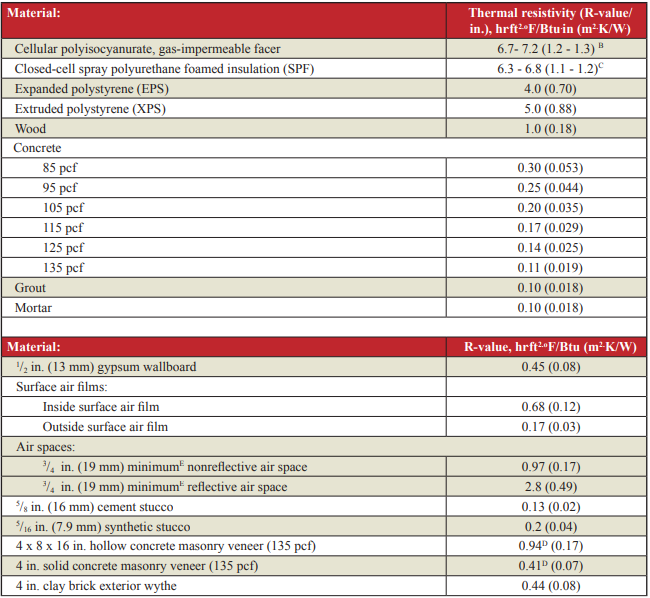
**Start:** Reference NCMA Tek Note 06-01C for a brief description of the Series-Parallel R-value Calculation. The image below can be found in the Tek Note and shows the formula used in the Series-Parallel R-value Calculation as well as what each variable in the formula represents.

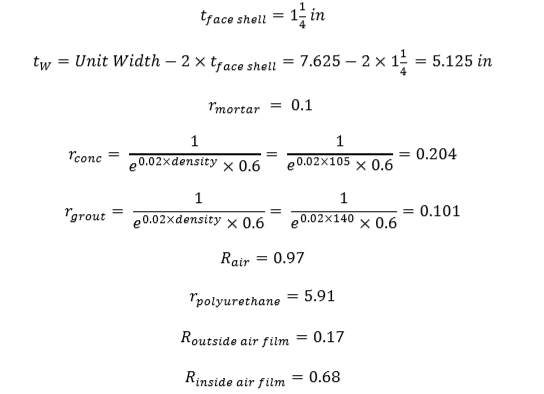


1. From assumptions listed in the Task, list and/or calculate the face shell thickness, length of concrete web.

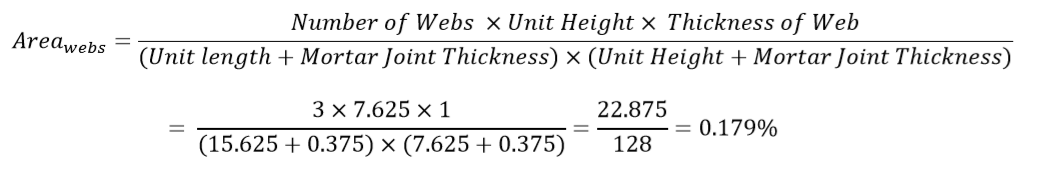


1. List and/or Calculate the thermal resistivity of mortar, concrete, air, polyurethane, outside air film, and inside air film. *These values can be found in Table 5 of NCMA Tek Note 06-01C OR calculated with the following equations below.*





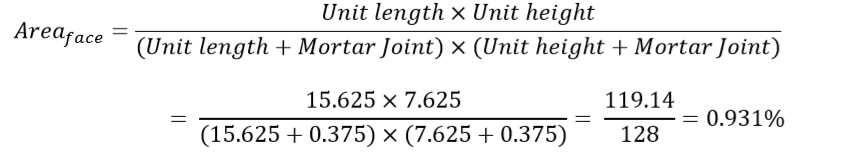
1. Calculate the Area of the Web



1. Calculate the Area of the Core



1. Calculate the Area of the Face



1. Calculate the Area of the Mortar



1. Calculate the R-value of the Face.



1. Calculate the R-value of the Mortar.

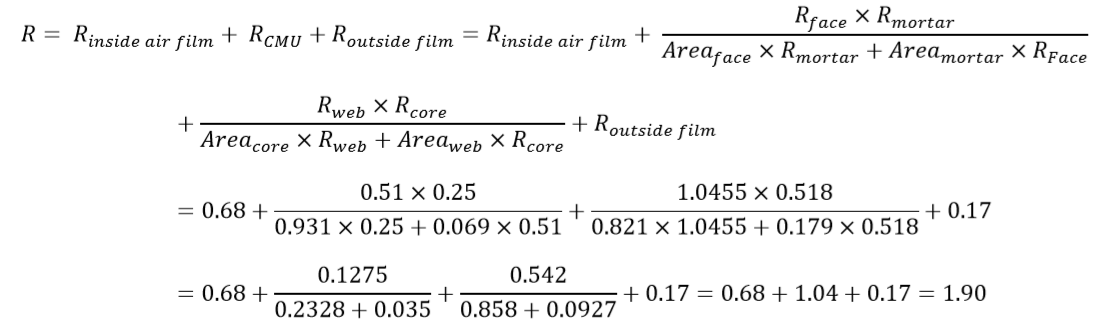


1. Calculate the R-value of the Web.



1. Calculate the R-value of the Core.



1. Plug all values in the Series-Parallel Equation provided by the Tek Note.
2. Find the U-factor:

**End:** The R-value of an Assembly 1-1 – 8” x 8” x 16” 105 lb/ft3, 3-web CMU is **1.90** and the U-factor is **0.526**.