



**FLORIDA SOLAR ENERGY CENTER**

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*Creating Energy Independence Since 1975*

# *Total UA Alternative*

## Is it Equivalent to Method A?

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# *Total UA Alternative*

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- ❖  $UA = (\text{Component U-Factor}) \times (\text{Component Surface Area})$
- ❖ 
$$\text{Total UA} = UA_{\text{ceilings}} + UA_{\text{walls}} + UA_{\text{windows}} + UA_{\text{doors}} + UA_{\text{floors}}$$
- ❖ *Baseline* U-Factors for each component are as defined by code minimum prescriptive requirements
- ❖ *Baseline* Component Areas = *Proposed* Component Areas
- ❖ To achieve code compliance:  
$$\text{Total UA}_{\text{proposed}} \leq \text{Total UA}_{\text{baseline}}$$



## *Ex: Ceiling vs. Windows*

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- ❖ 2,000 sq. ft. single-story, frame home configured as per proposed 2010 FEC Method B
- ❖ Change to high-performance windows (U-0.30 / SHGC-0.30)
- ❖ Reduce ceiling insulation maintaining Total UA Alternative compliance
- ❖ Results in R-6 ceiling insulation
- ❖ How does this compare with Method A performance requirement (e-Ratio  $\leq 0.80$ )?



# *Total UA Results*

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**PASSES:** Total Proposed UA < Total Baseline UA

| UA Calculation Summary |             |             |
|------------------------|-------------|-------------|
| Component:             | Proposed UA | Baseline UA |
| Walls                  | 86          | 86          |
| Window & Doors         | 138         | 286         |
| Ceilings               | 203         | 64          |
| Floors                 | 0           | 0           |
| <b>Total UA:</b>       | <b>428</b>  | <b>436</b>  |



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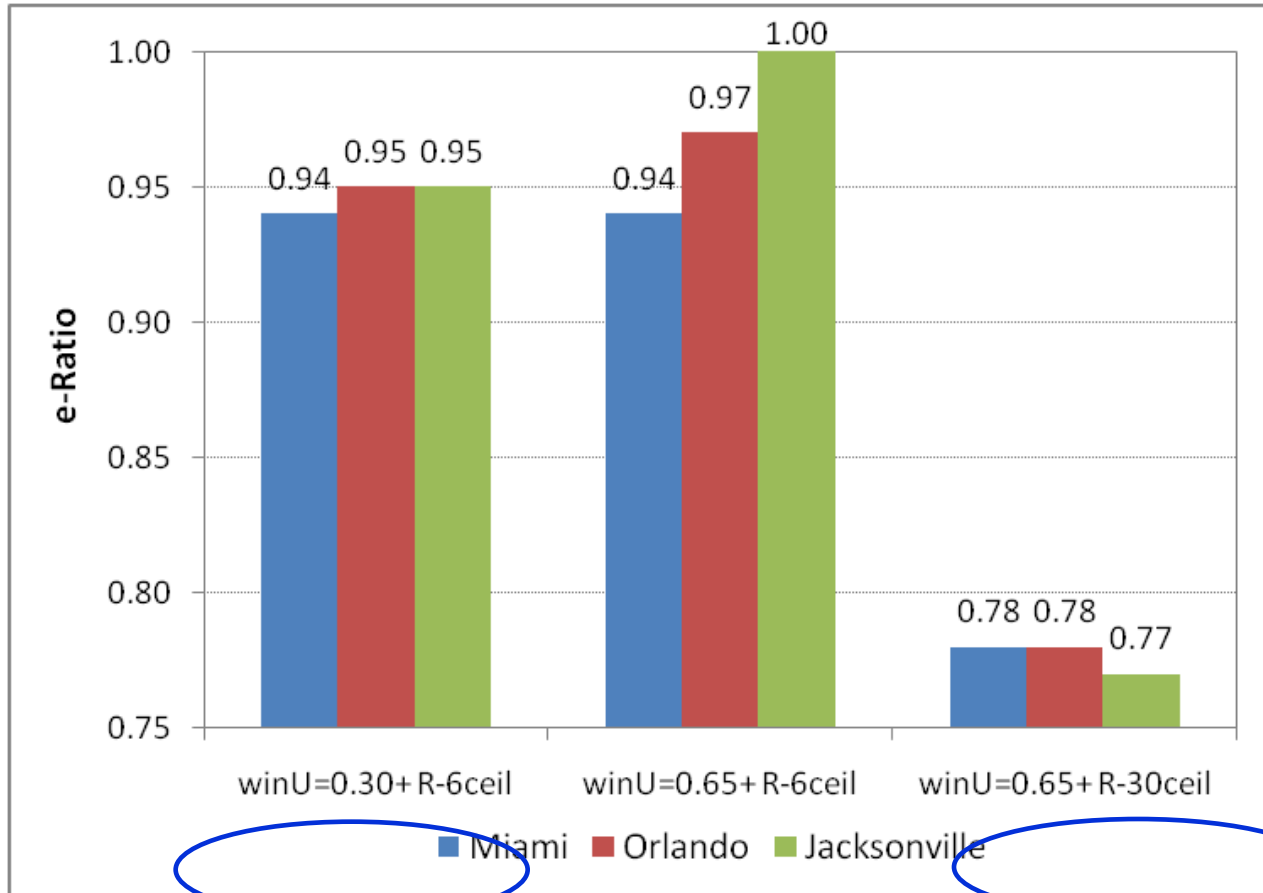
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## *Spreadsheet Examples*



# Method A Calculations





# *Conclusions*

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- ❖ There is a significant difference in equivalence between Method A (performance option) and the IECC Total UA Alternative option
- ❖ The IECC Total UA Alternative option does not result in equivalent compliance in Florida.