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Applies to:
2006 Mortgage Industry National Home Energy Rating Systems Standards
Table 303.4.1(1) Notes, footnote b).

Amendment: Revision of F-factor equation

Background

The 2006 Mortgage Industry National Home Energy Rating System Standards (RESNET standards) state that multi-family attached reference homes shall be configured with the following window area:

"(b) For homes with conditioned basements and for multi-family attached homes the following formula shall be used to determine total window area:

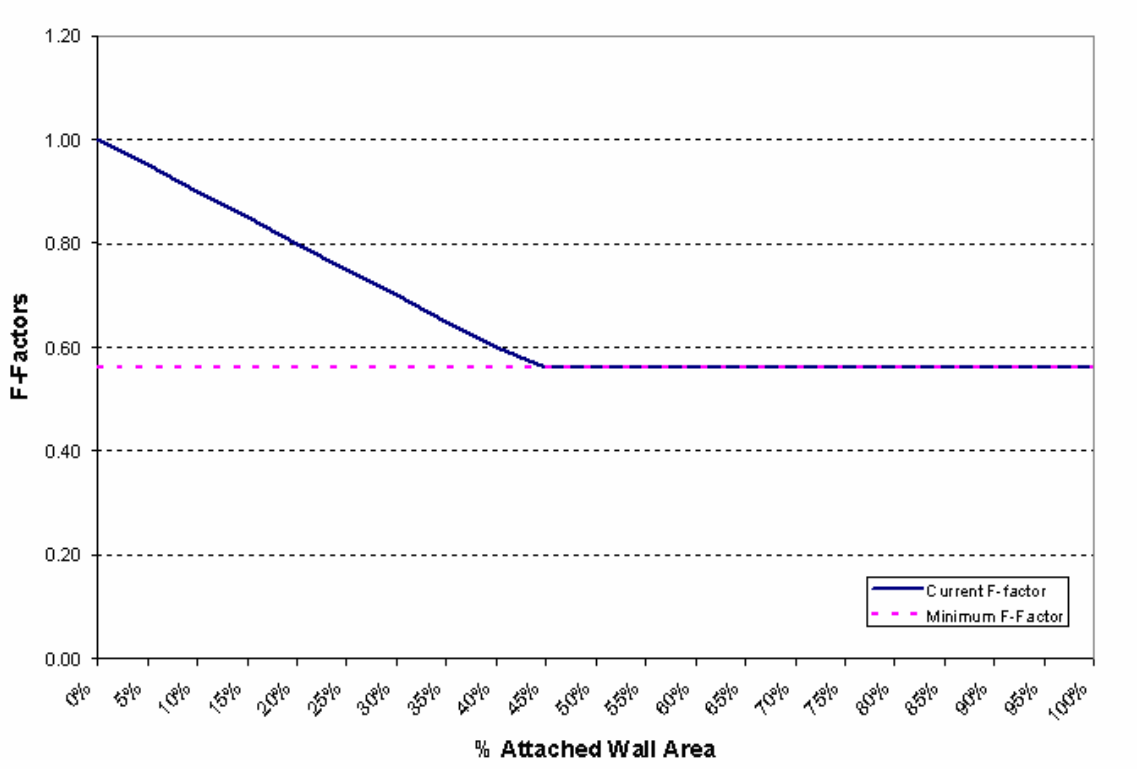
AF = 0.18 x AFL x FA x F

where:
AF = Total fenestration area
AFL = Total floor area of directly conditioned space FA = (Above-grade thermal boundary gross wall area) / (above-grade boundary wall area + 0.5 x below-grade boundary wall area)
F = (Above-grade thermal boundary wall area) / (above-grade thermal boundary wall area + common wall area) or 0.56, whichever is greater

and where:"…

"Common wall is the total wall area of walls adjacent to another conditioned living unit, not including foundation walls."

Graphically, the equation for the "F" factor is represented as follows:



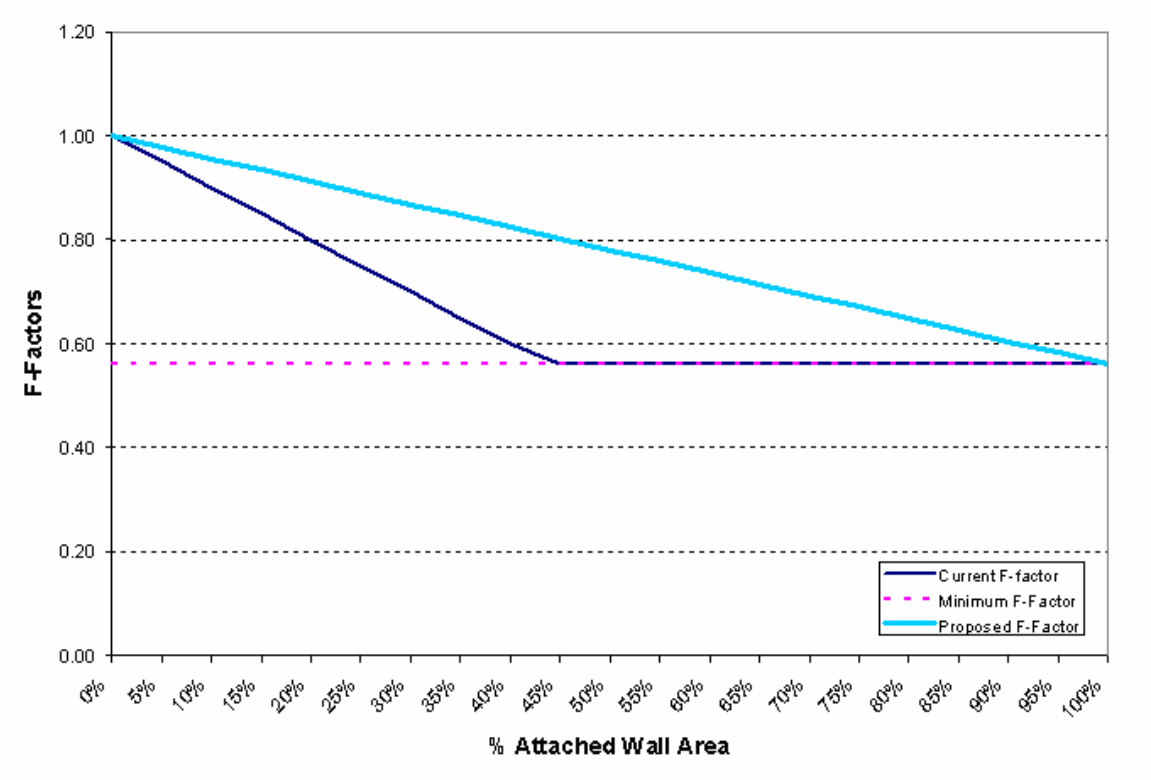
With the current equation, the window area to floor area (WFA) ratio ranges from 18.0% for homes with no attached walls down to 10.1% for all homes with attached wall area greater than 44% of total wall area. The rationale for maintaining the WFA ratio at a constant 10.1% value for all homes with common wall area above 44% is not known. Furthermore, the fact that the equation is not linear between the two end points (i.e., 0% attached wall area and 100% attached wall area) results in inconsistent performance trends of homes with attached wall area greater than 44%.

Proposed Amendment

To more accurately represent window area in attached housing, it is proposed that the F-factor equation be revised to the following:

F =1- 0.44 * (~~Above-grade thermal boundary wall area~~ Common Wall Area) / (above-grade thermal boundary wall area + common wall area) ~~or 0.56, whichever is greater~~

Graphically, the revised F-factor is represented as:



This revised F-factor equation would result in the same WFA ratio for homes with no attached wall area and 100% attached wall area, but would define the WFA ratio for all points in between in a linear fashion. This will increase the WFA ratio in the reference home for all configurations except the end points and result in more consistent performance trends of homes with greater than 44% common wall area.