

COMPONENT MODELING APPROACH BASED NON-RESIDENTIAL PRODUCTS PROCEDURE: OUTSTANDING ISSUES

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ORIGINALLY DEFINED TECHNICAL ISSUES

- How do we develop a correlation between standard glazing bite and changes in bite design-we don't expect variation to be more than 1/8th " +/-.
- Develop correlation for std. ht. spacers vs. custom ht. spacers.
- Keep CRF values/procedures in mind when considering the technical issues/procedures.
- Establish frame grouping rules (both interior, exterior & profiles/depths)
- For certification purposes how are we going to handle size issues (i.e. NFRC size vs. Project size?)
- How do we handle effect of glass thickness (i.e. Lami) & glass conductivity?

ORIGINALLY DEFINED PROGRAMMING ISSUES

- Safety checks that establish ranges of values that will not allow bad input.
- Allow for defining NFRC standard size, actual project size, and area weighted U factor values.

ORIGINALLY DEFINED USER ISSUES

- Training/testing/certifying users-users must meet certain criteria/get values for examples during testing
- Auditing users-a % needs to be defined.
- Cost of training/cost of auditing
- Define Penalties (i.e. replacement of product plus NFRC fine).
- Need "How to Guide" paper and web based.

CONSOLIDATED TECHNICAL ISSUES

- Effect of Glazing Bite on U-Factors
- Effects of glass thickness on overall U-factors
- Effects of spacer position within the glazing on U-factors
- Effects of spacer height on overall U-factors
- Definition of generic Best/Worst IGU and spacers
- Condensation Resistance

CONSOLIDATED PROGRAMMING ISSUES

- Establish frame grouping rules (both interior, exterior & profiles/depths)
- For certification purposes how are we going to handle size issues (i.e. NFRC size vs. Project size?)
- Allow for defining NFRC standard size, actual project size, and area weighted U factor values Effects of glass thickness on overall U-factors
- Safety checks that establish ranges of values that will not allow bad input
- Modification of THERM and WINDOW software to be compatible with the NRFEN
- Creation of IGU and spacer assemblies "on-line"
- Web based NRFEN vs. local installation

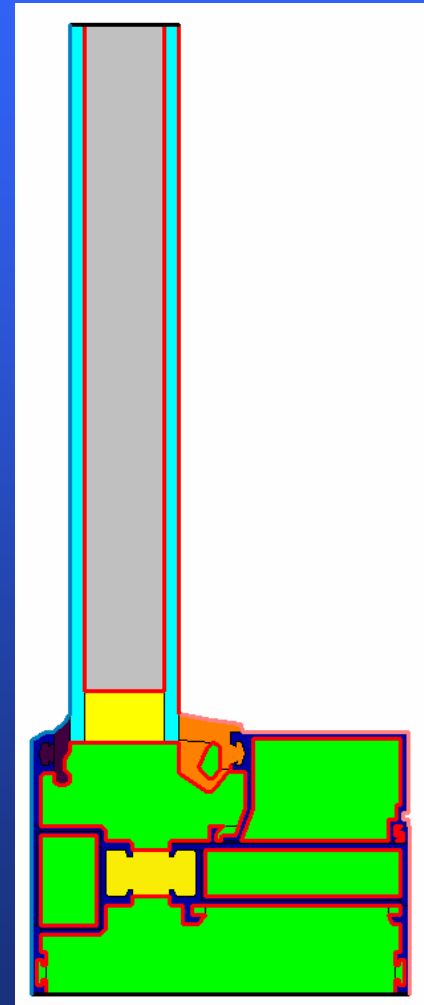
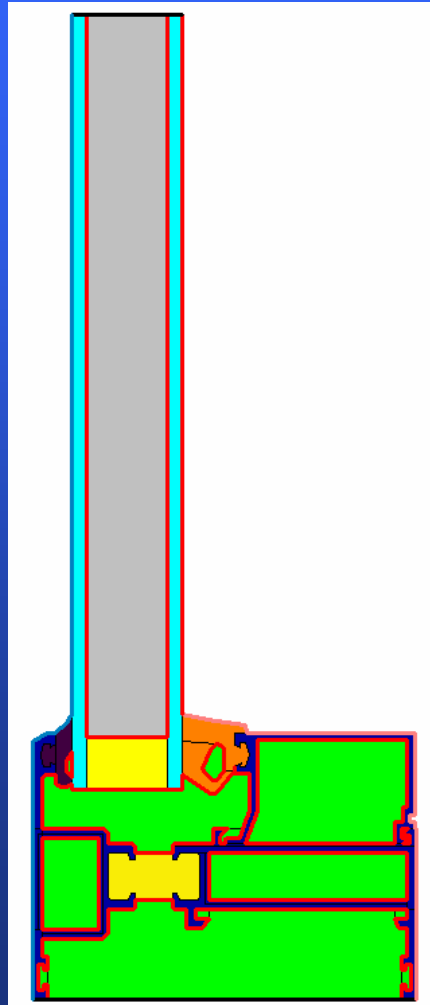
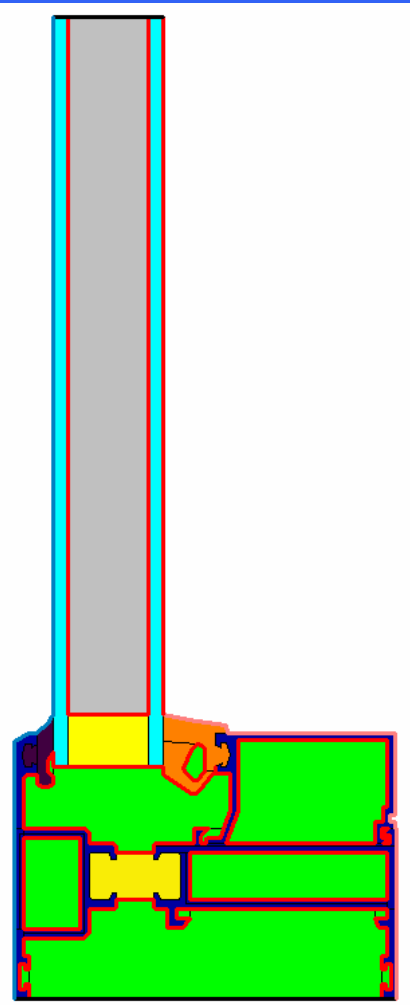
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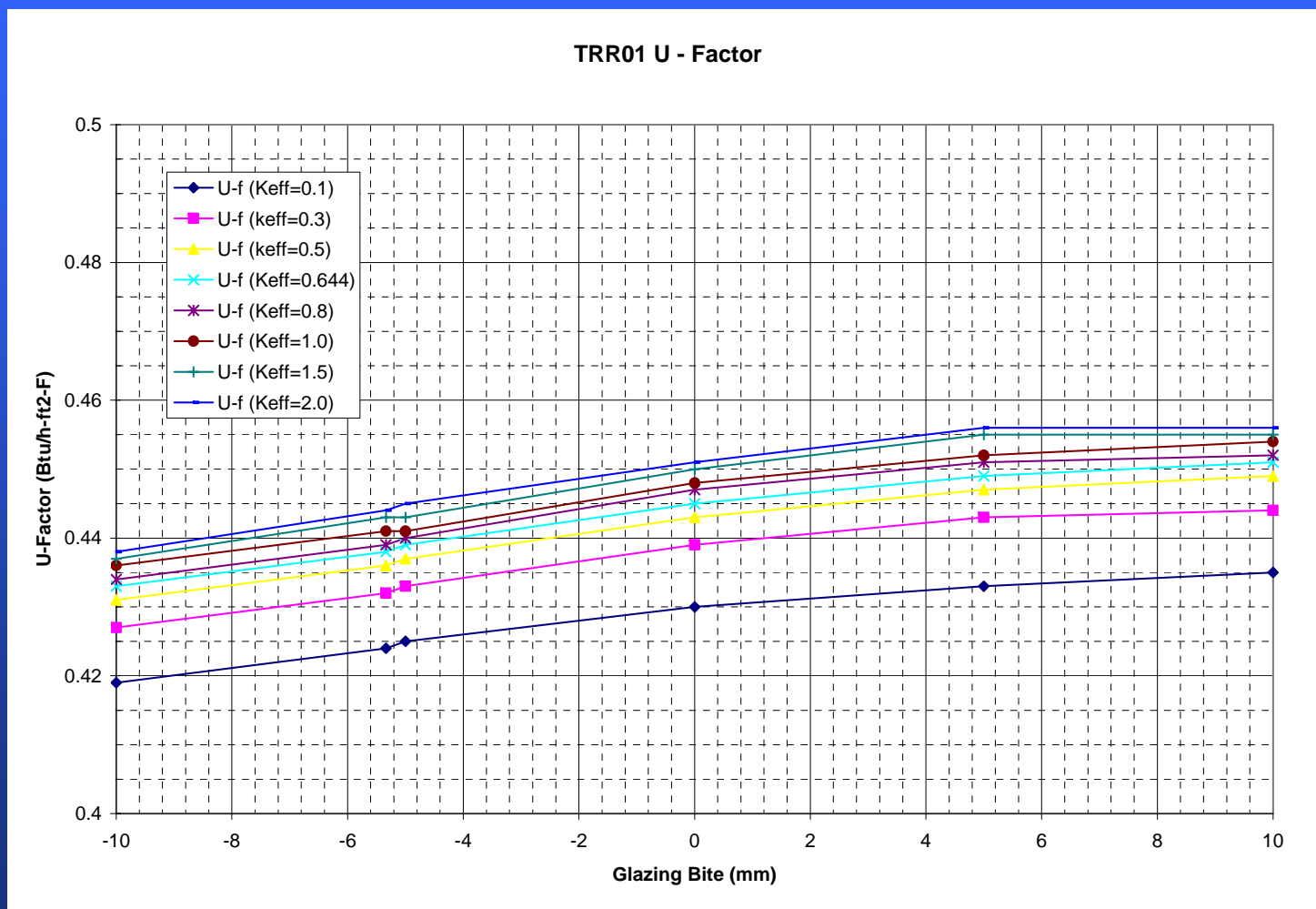


TECHNICAL ISSUES

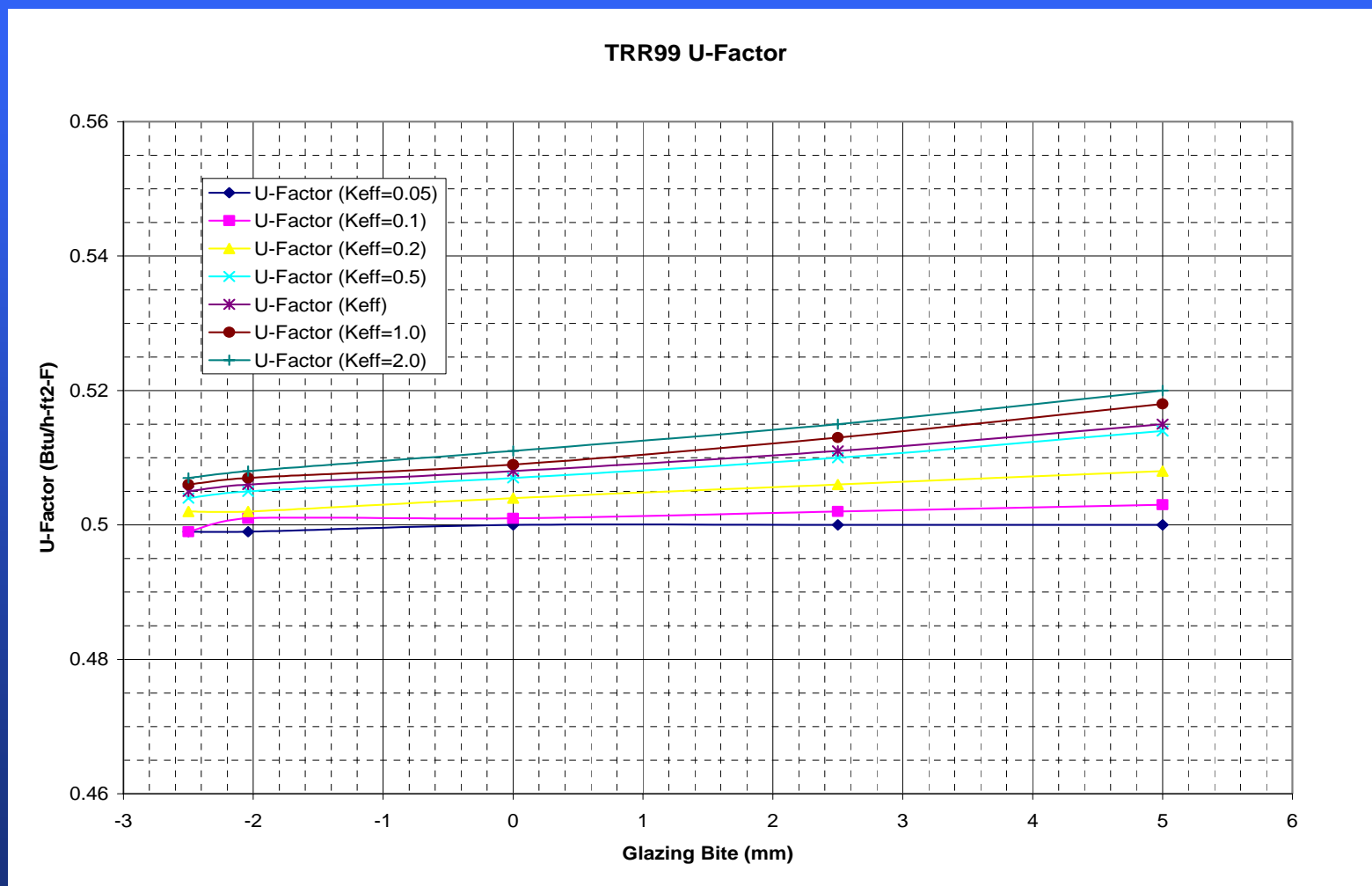
EFFECT OF GLAZING BITE



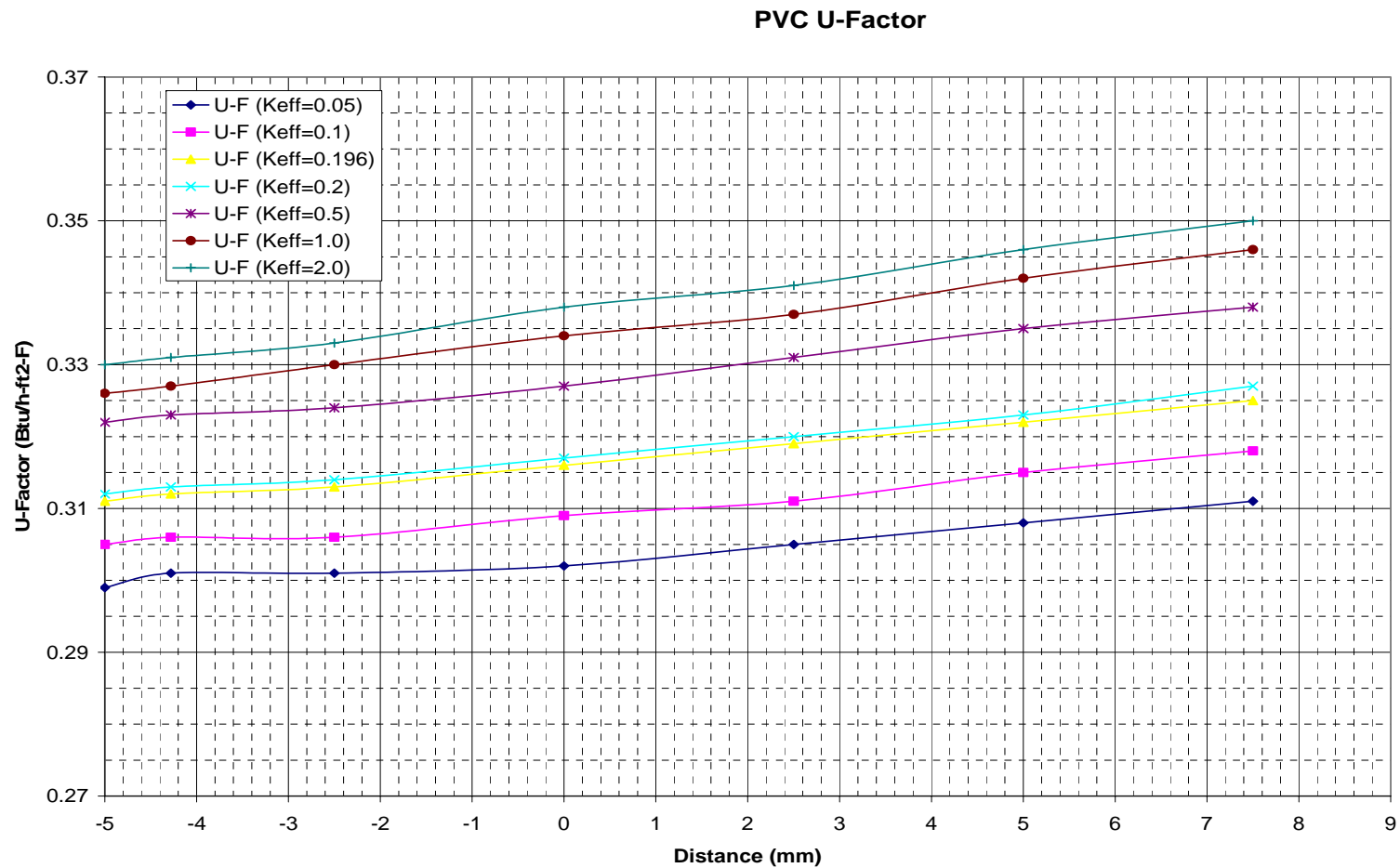
EFFECT OF GLAZING BITE – TRR01



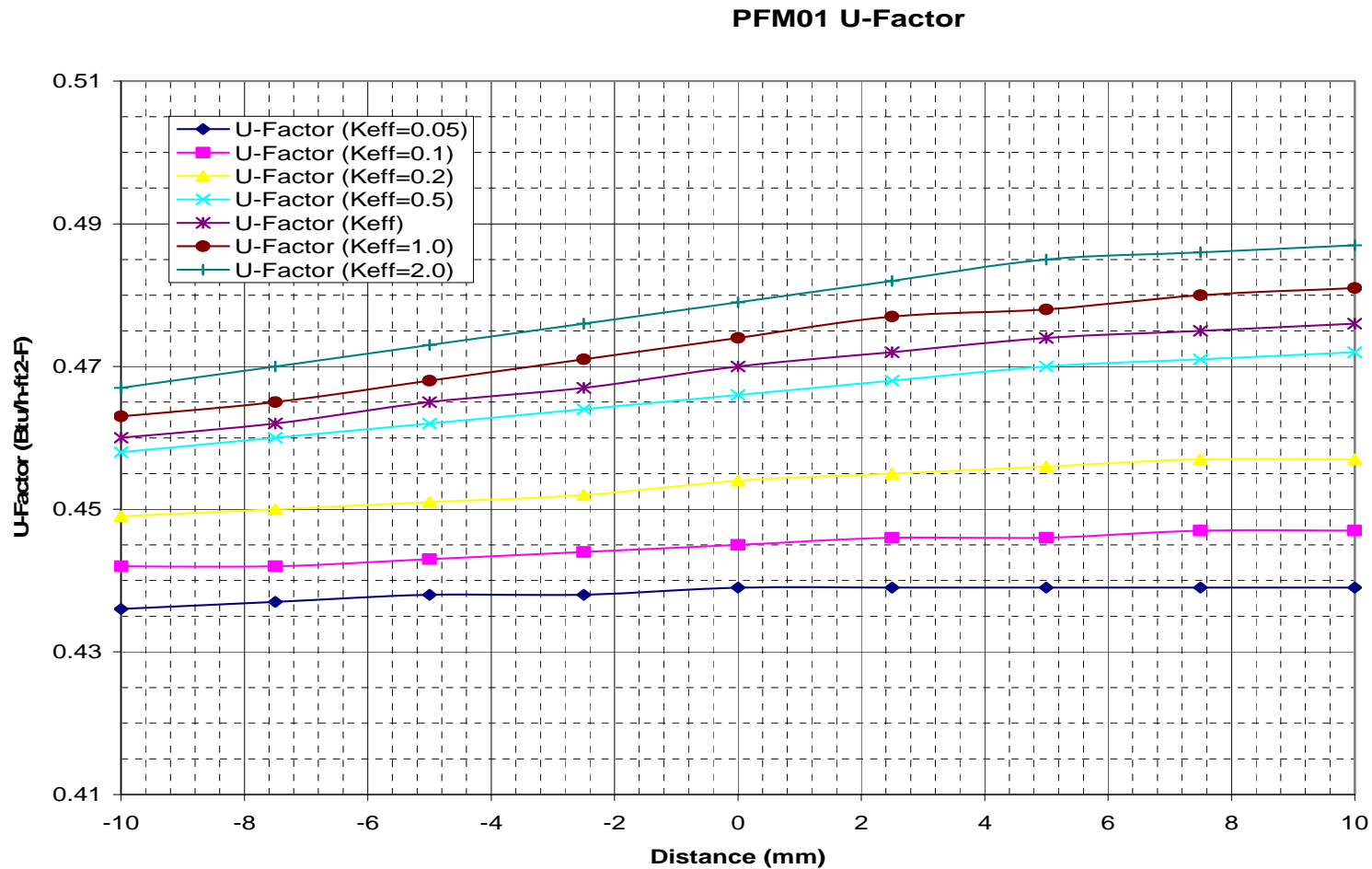
EFFECT OF GLAZING BITE – TRR99



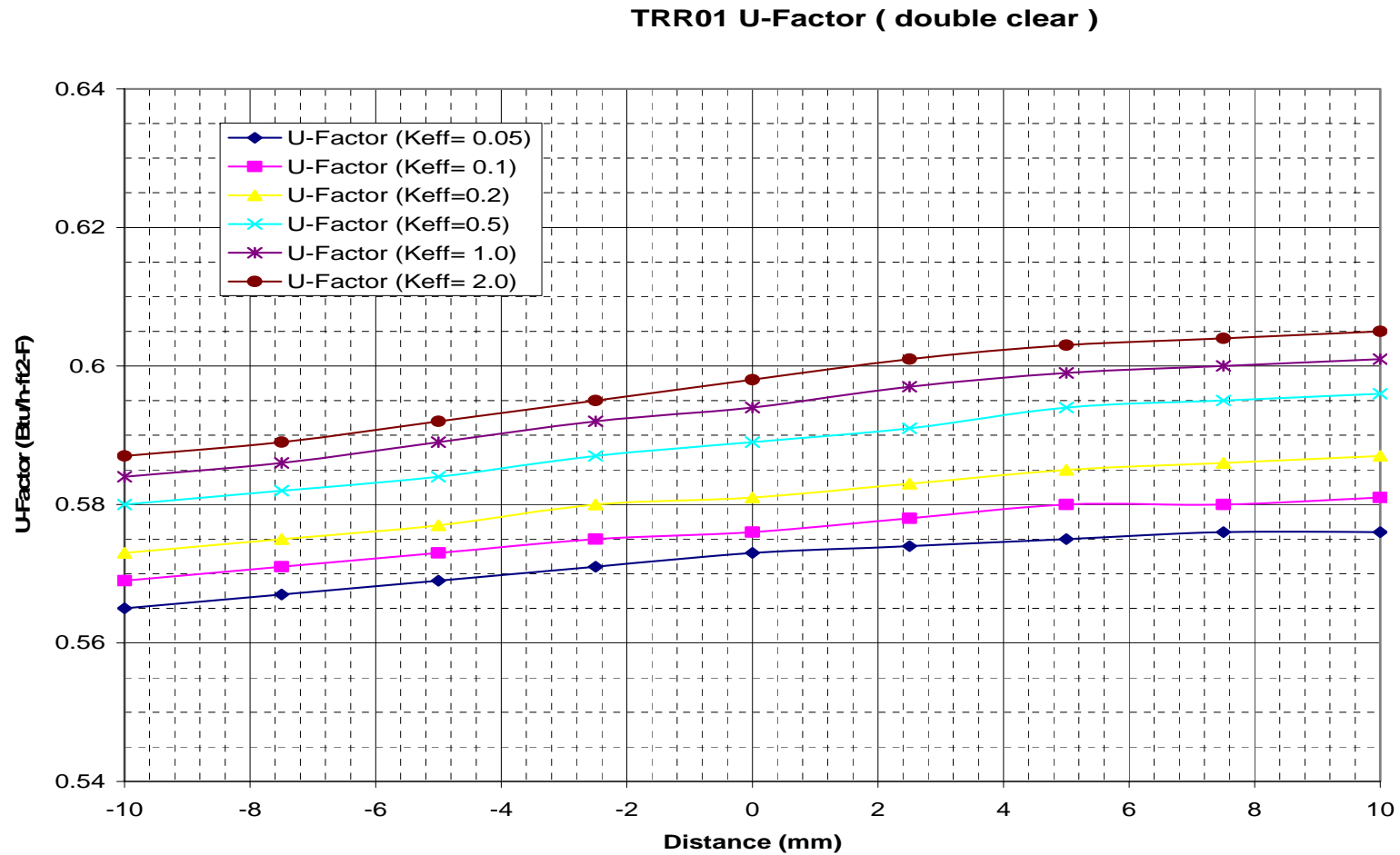
EFFECT OF GLAZING BITE – PVC



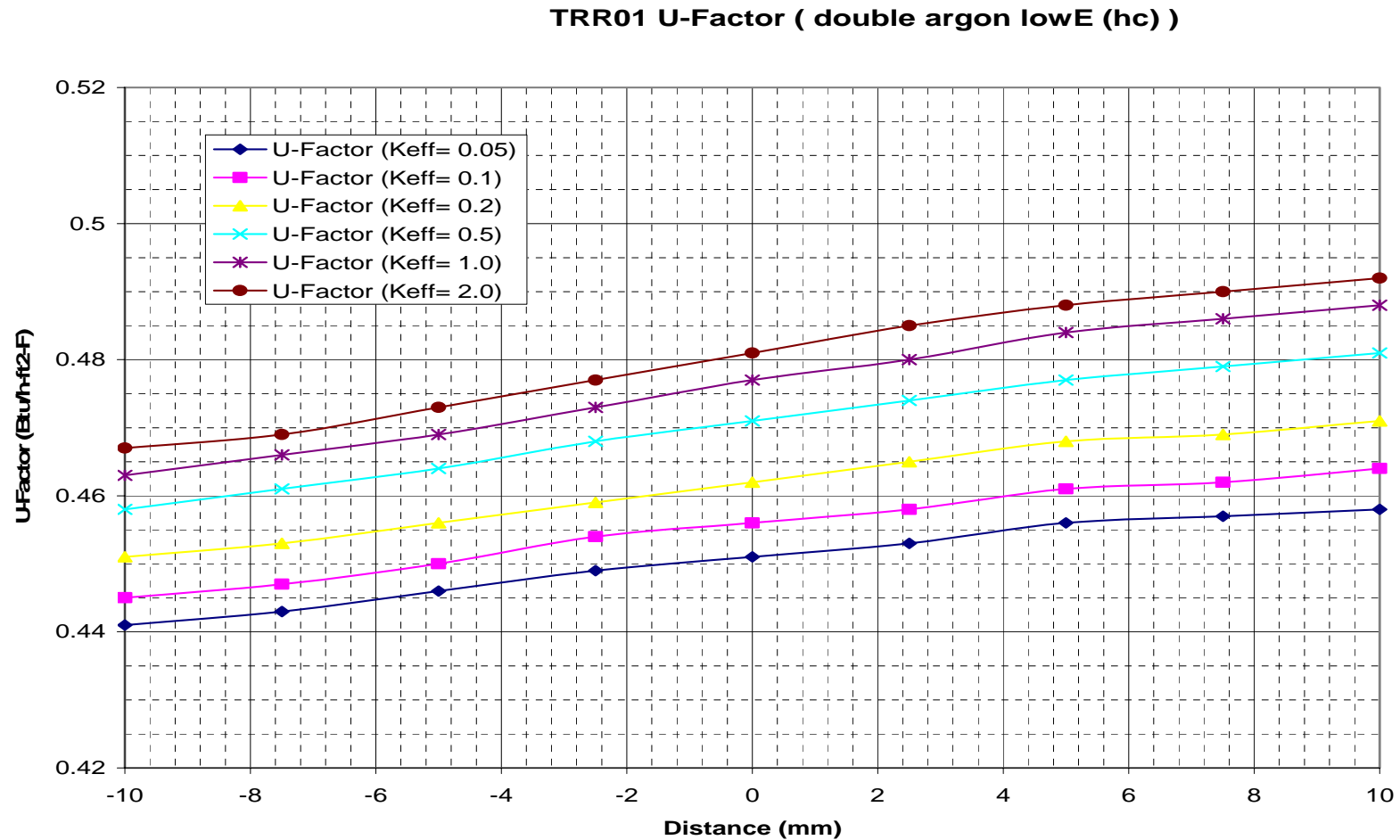
EFFECT OF GLAZING BITE – WOOD



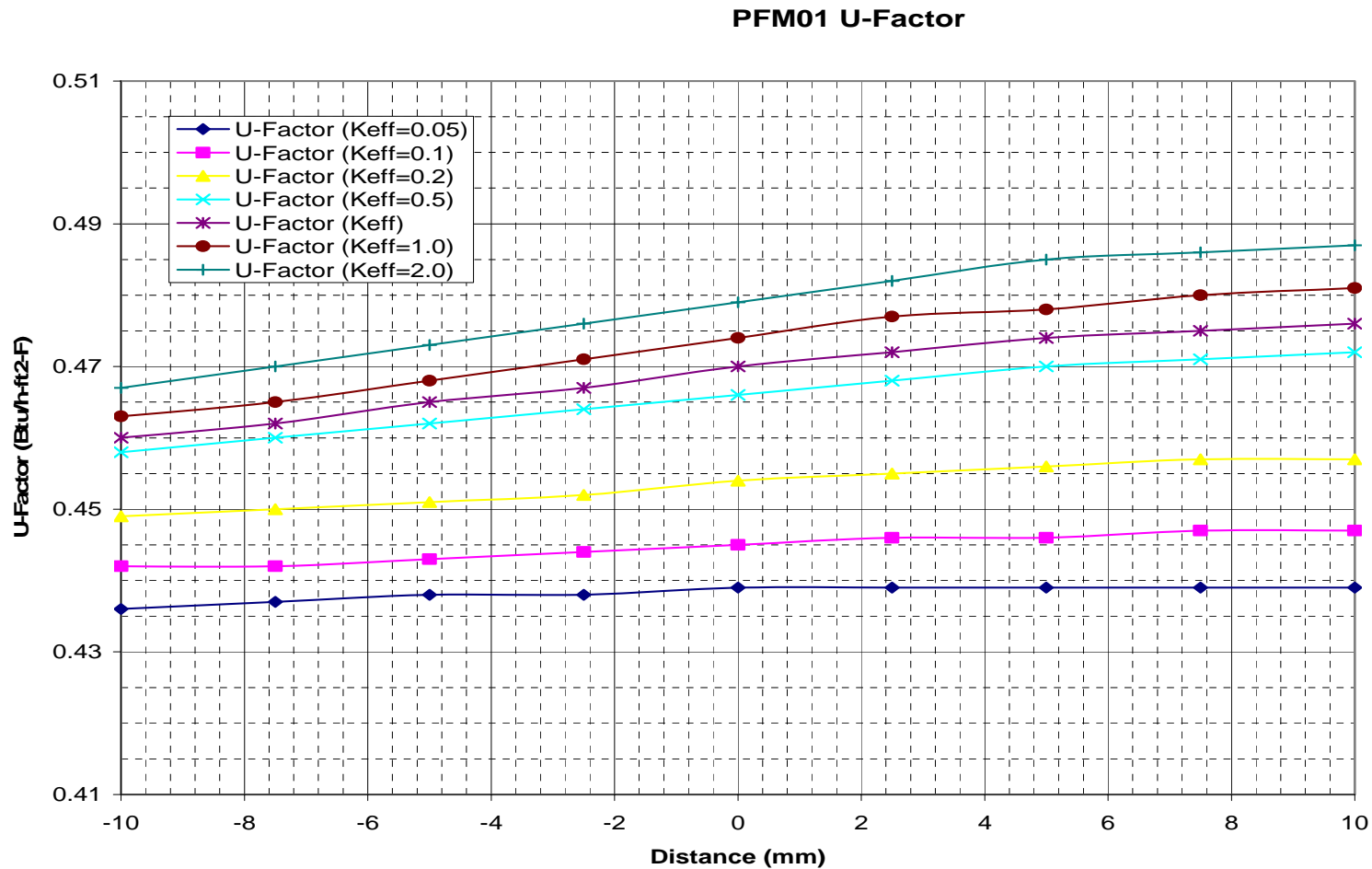
EFFECT OF GLAZING BITE: TRR01 DOUBLE CLEAR



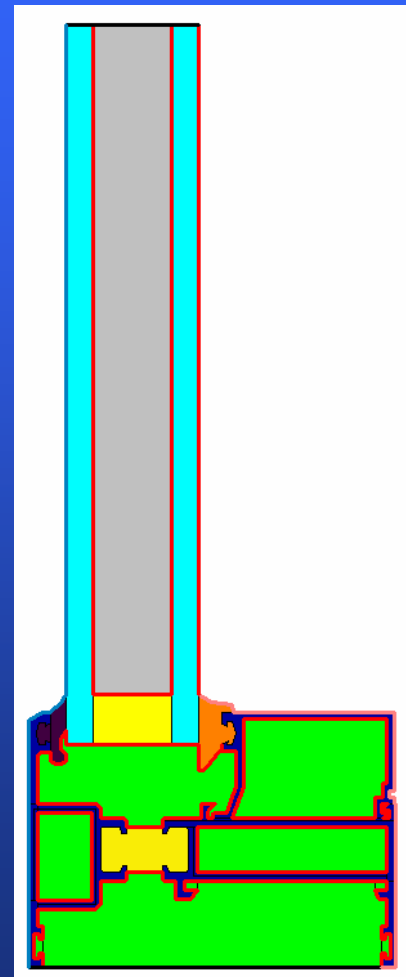
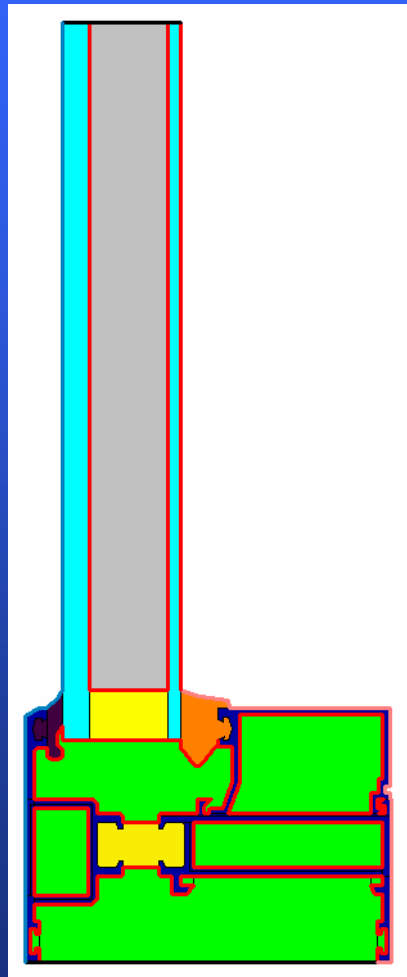
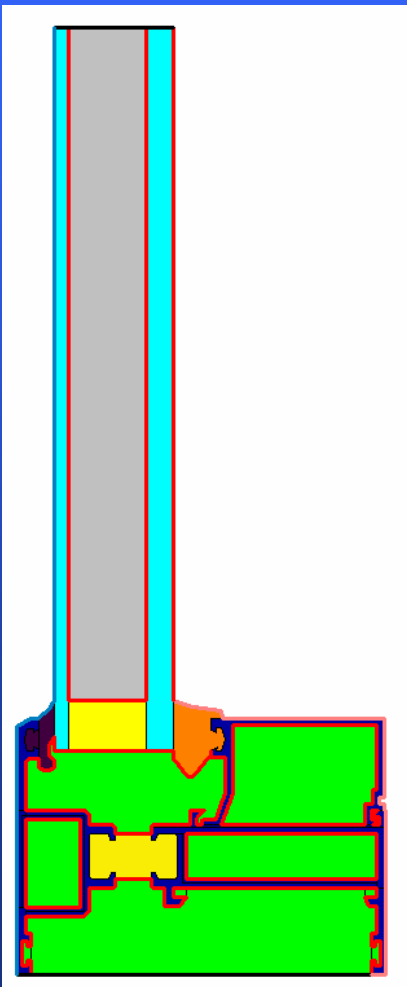
EFFECT OF GLAZING BITE: TRR01 DOUBLE LOW-E HC ARGON



EFFECT OF GLAZING BITE: TRR01 DOUBLE LOW-E SC KRYPTON

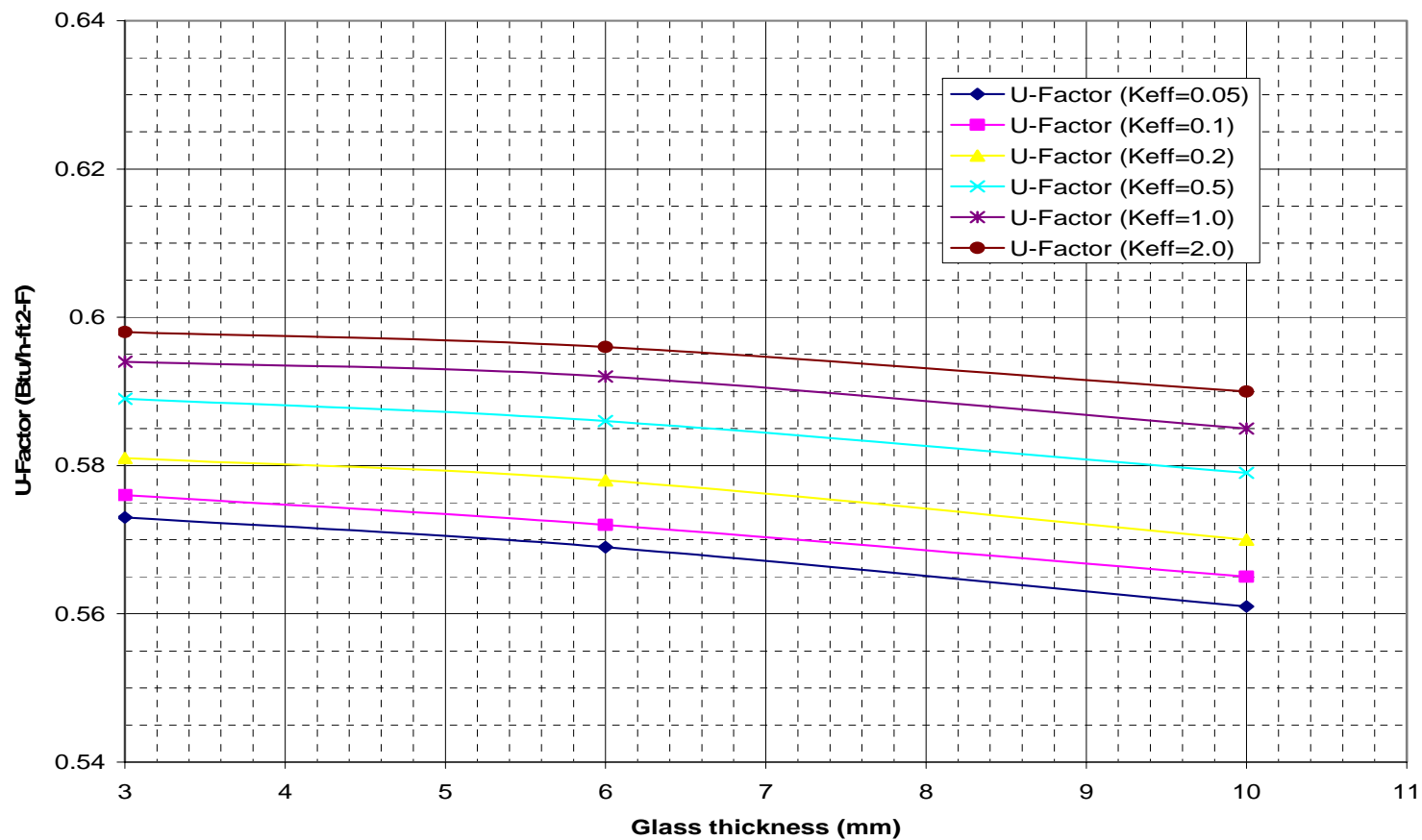


EFFECT OF GLASS THICKNESS



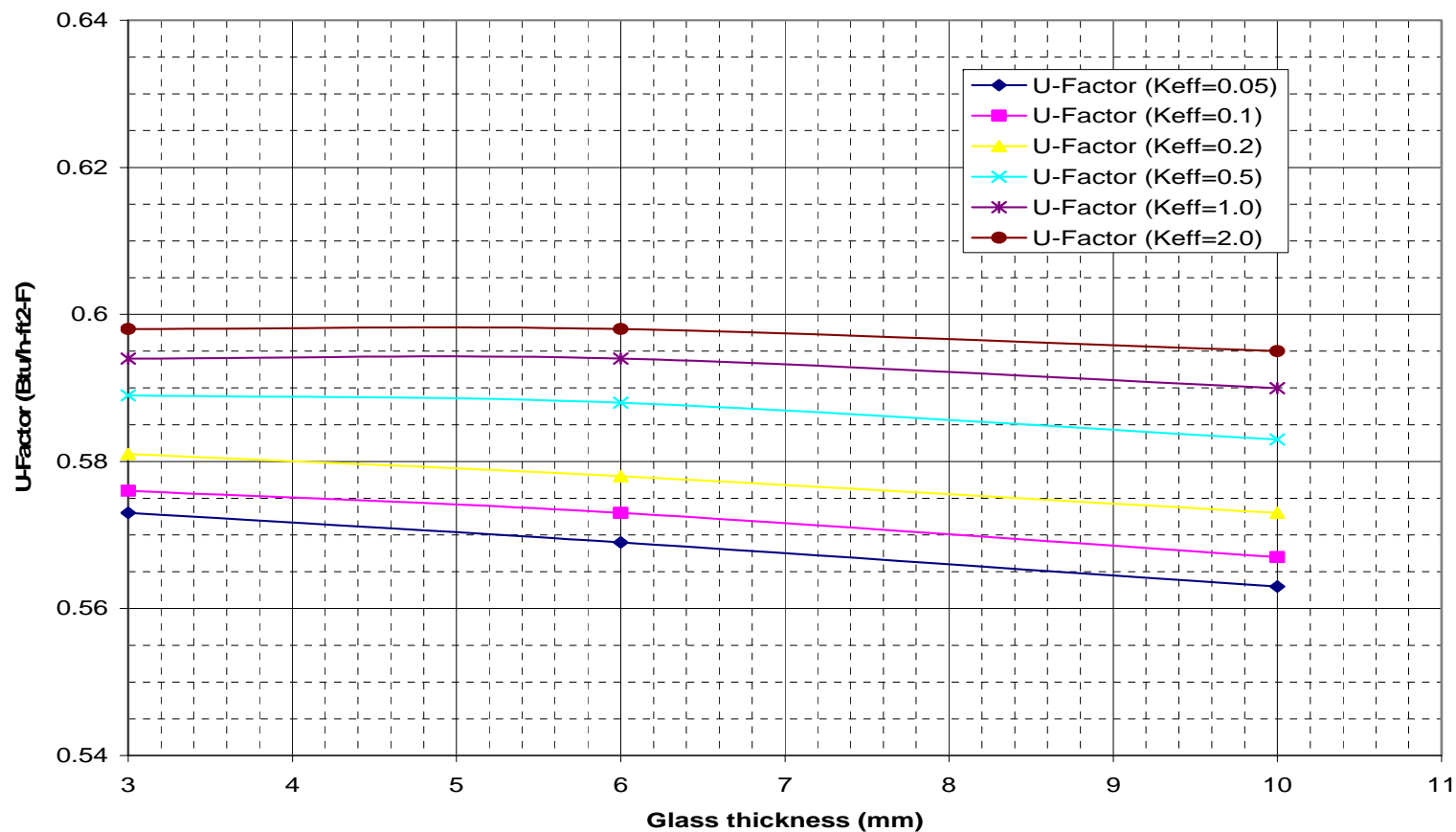
EFFECT OF GLASS THICKNESS – T/B-AI

U-Factor (double clear, Indoor Glass Variation) Glz_byte - flush



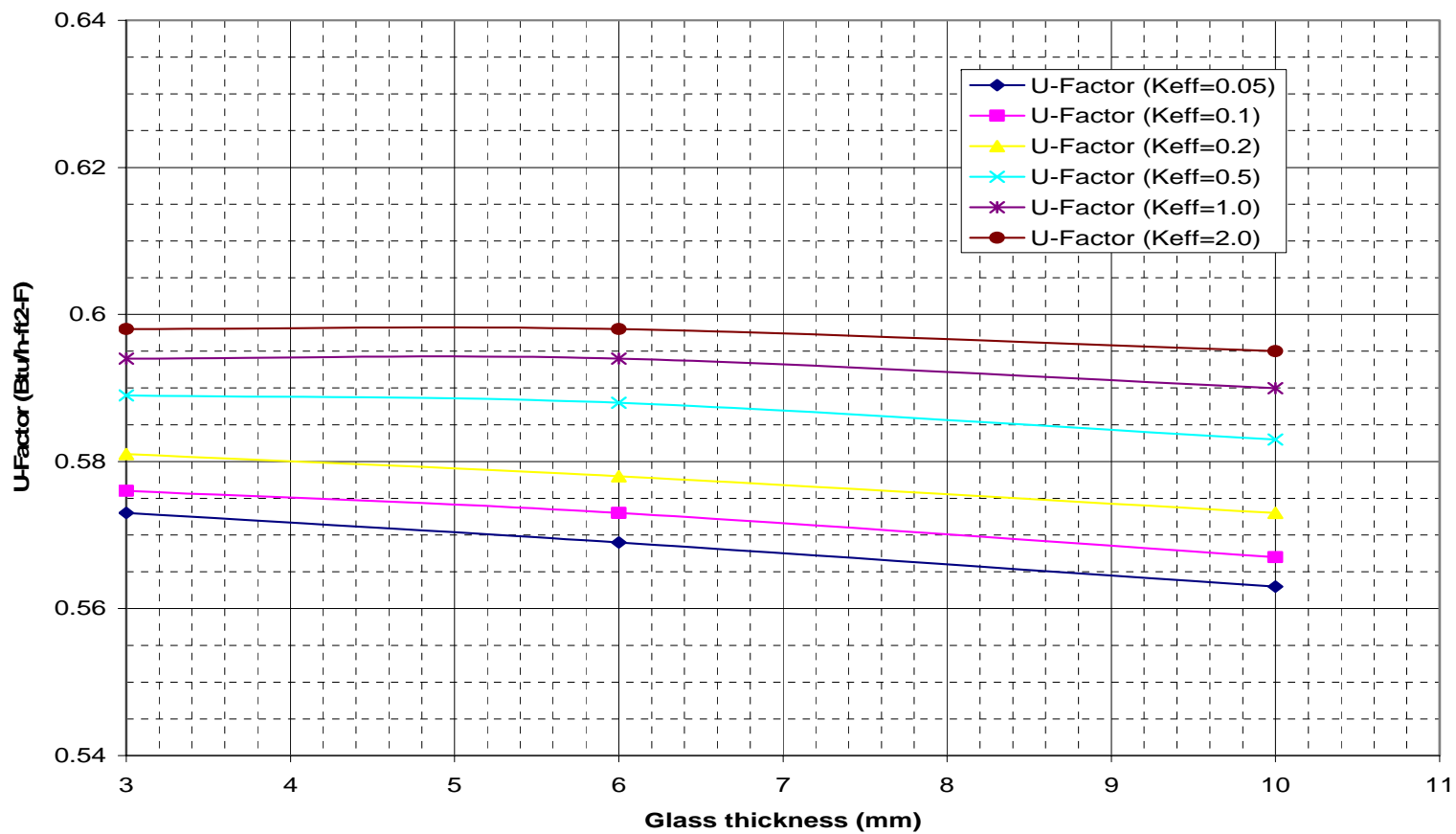
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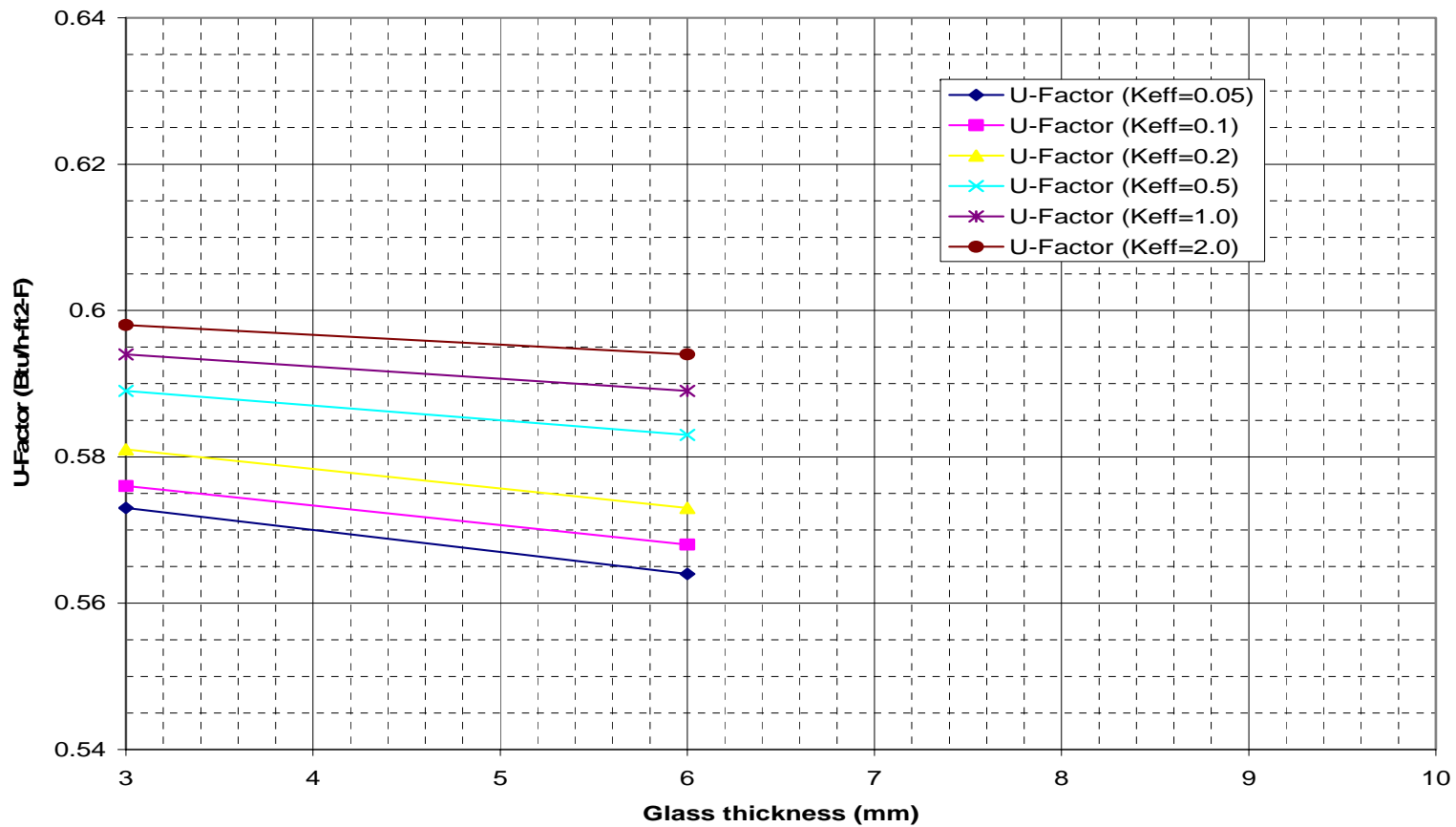
EFFECT OF GLASS THICKNESS: T/B-AI Outdoor Glass Thickness Variation

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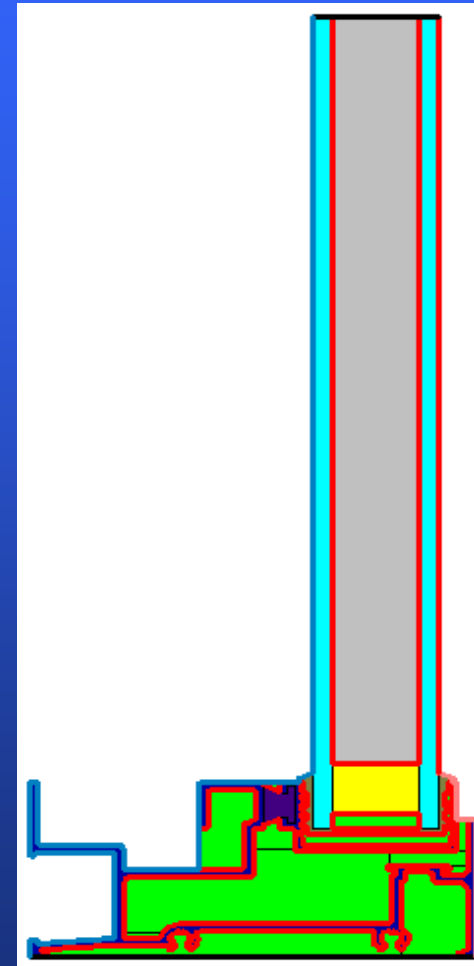
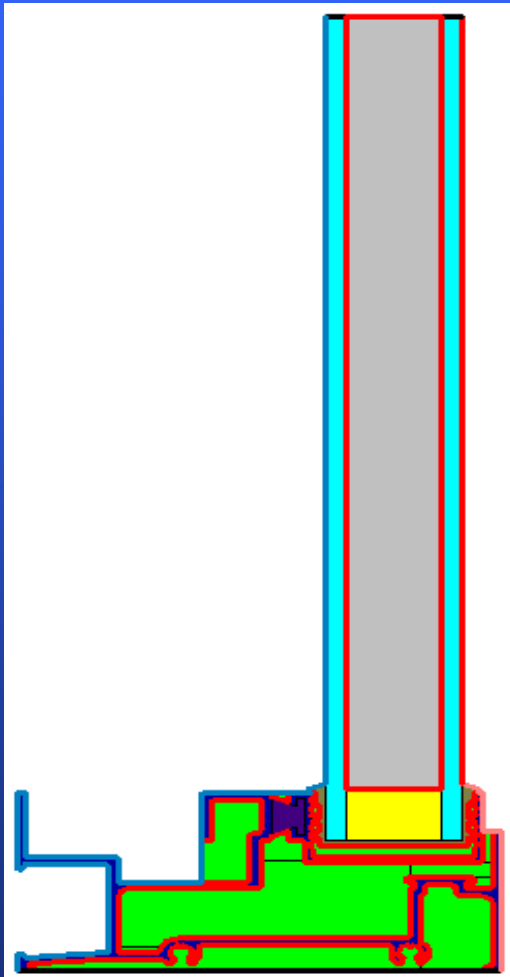


EFFECT OF GLASS THICKNESS: T/B-AI Both Glasses Thickness Variation

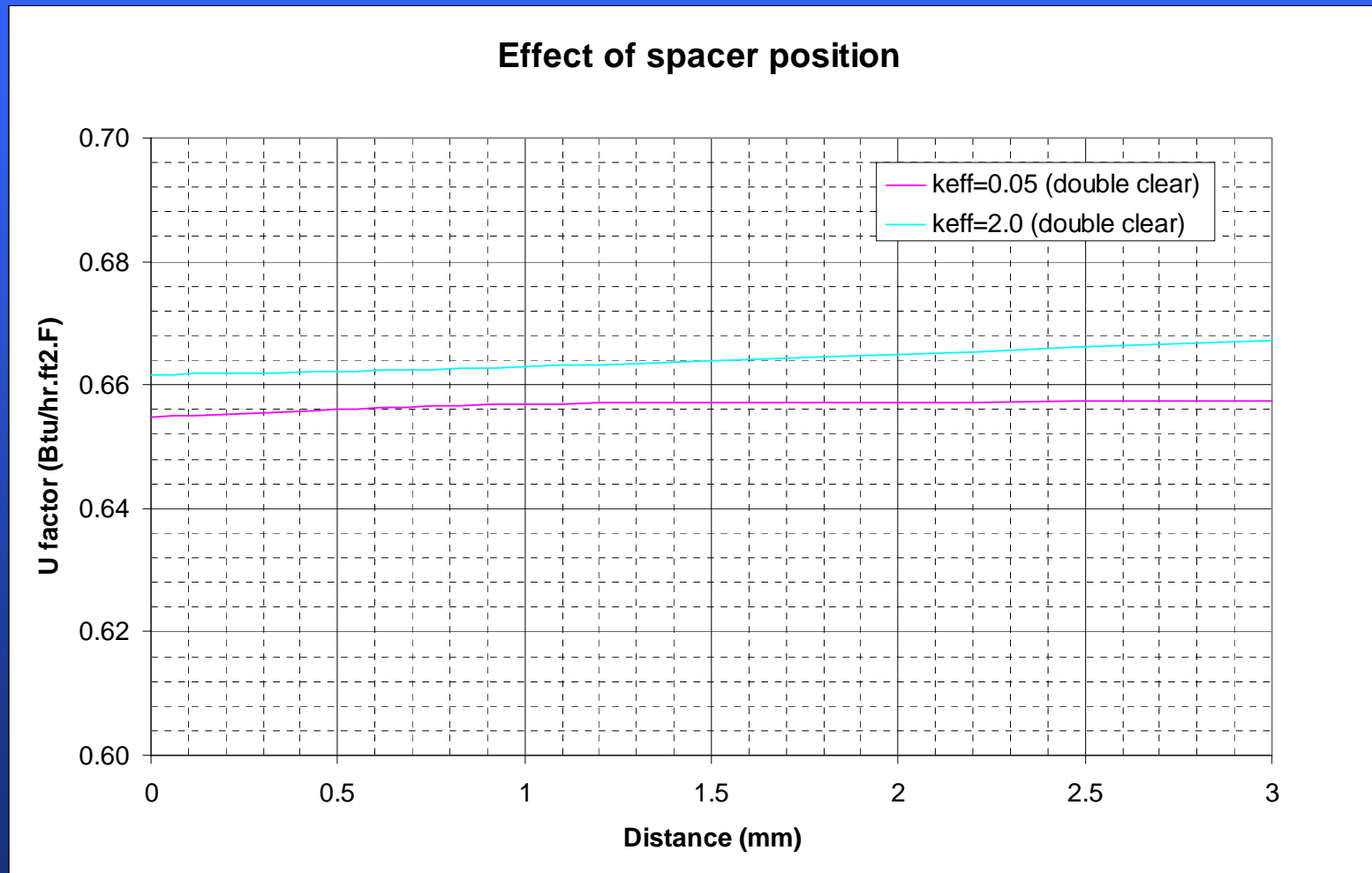
U-Factor (double clear, Both Glass Variation) Glz_byte - flush



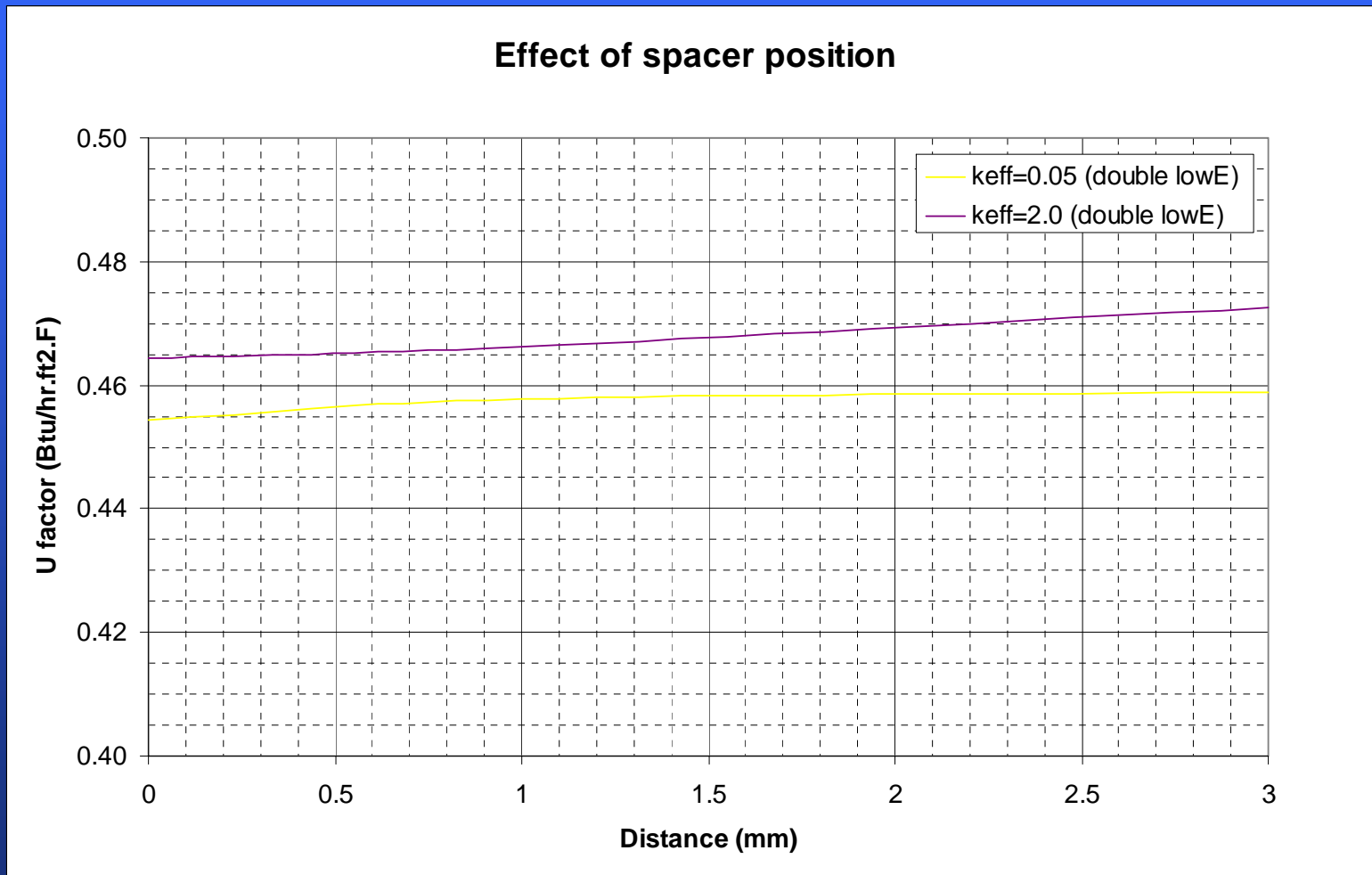
EFFECT OF SPACER LOCATION



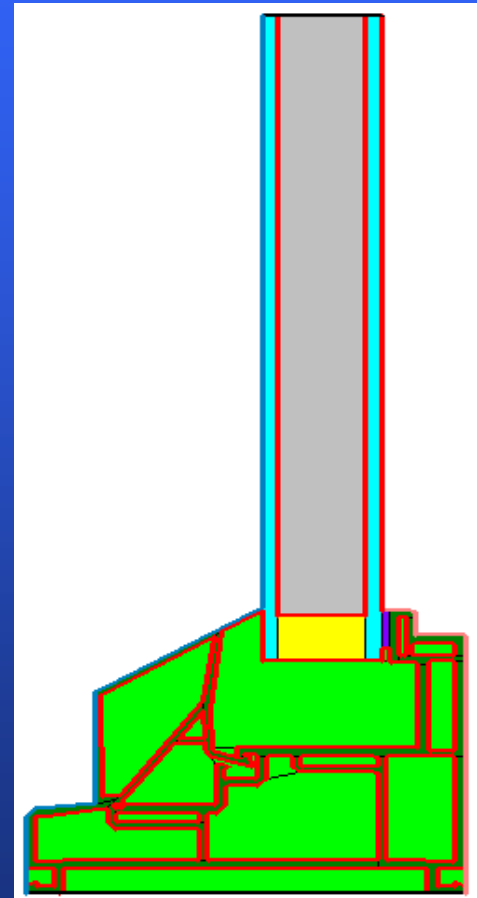
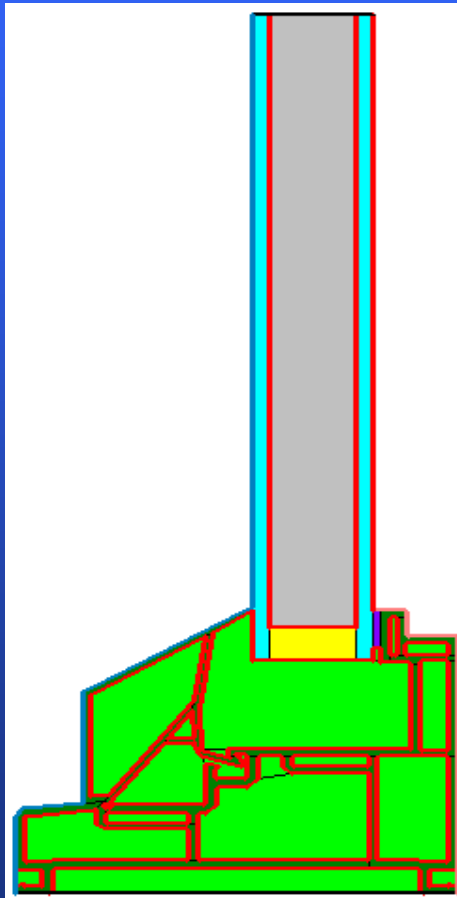
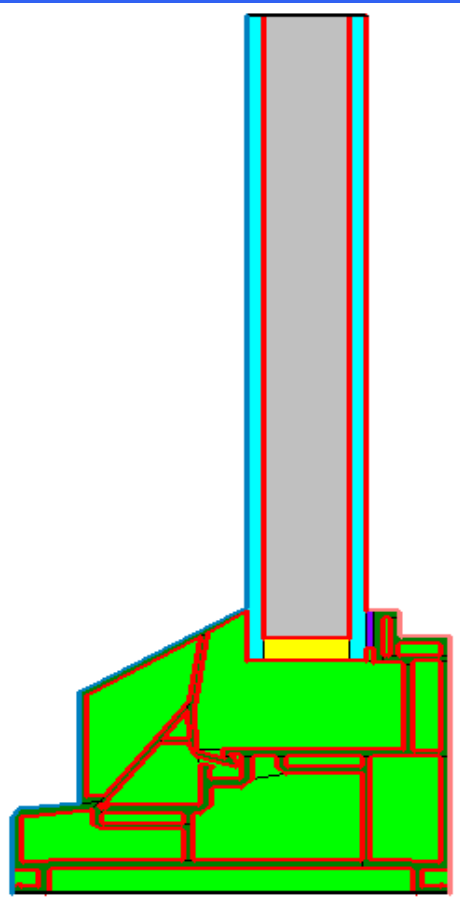
EFFECT OF SPACER LOCATION: TRR99, DOUBLE CLEAR AIR



EFFECT OF SPACER LOCATION: TRR99, DOUBLE LOW-E SC ARGON

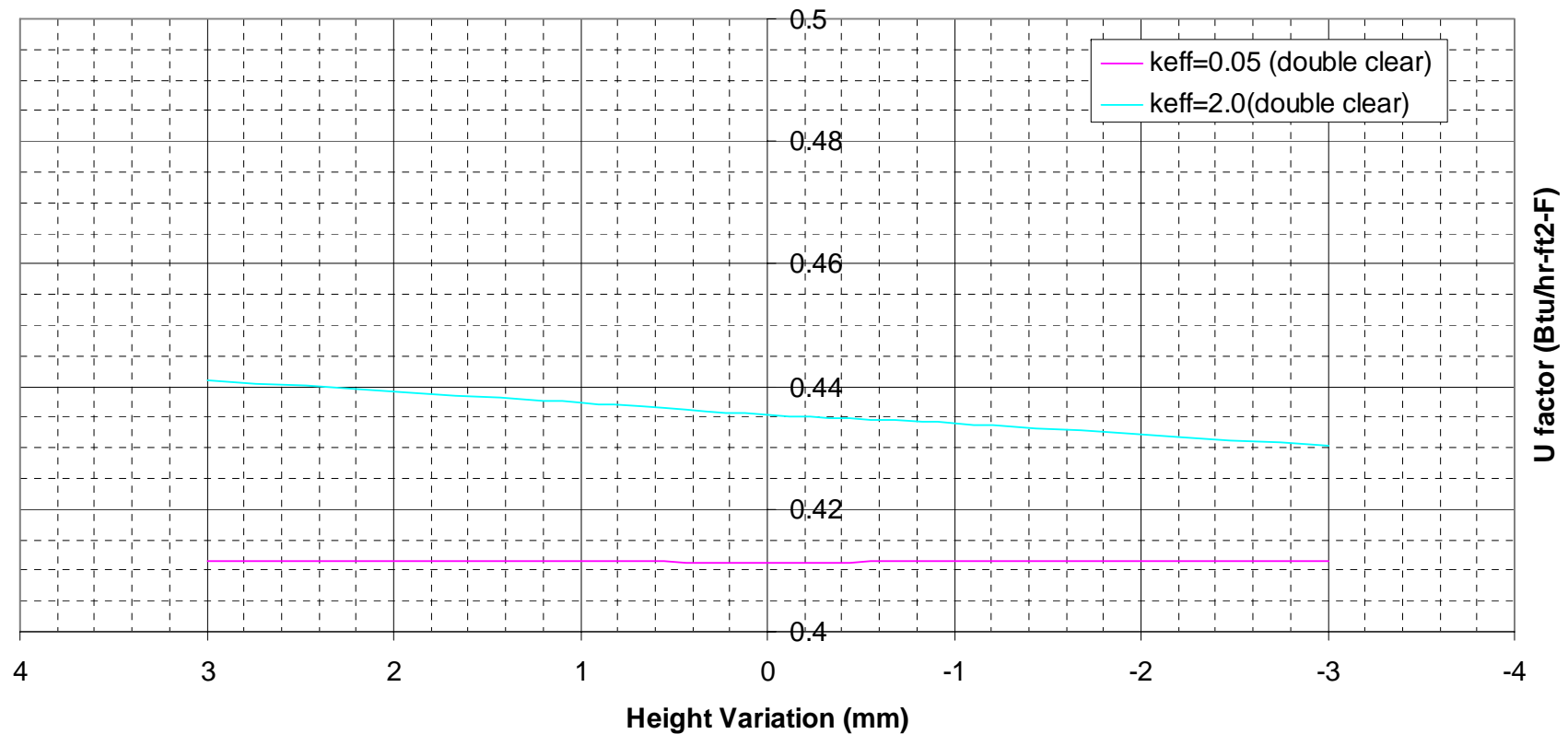


EFFECT OF SPACER HEIGHT

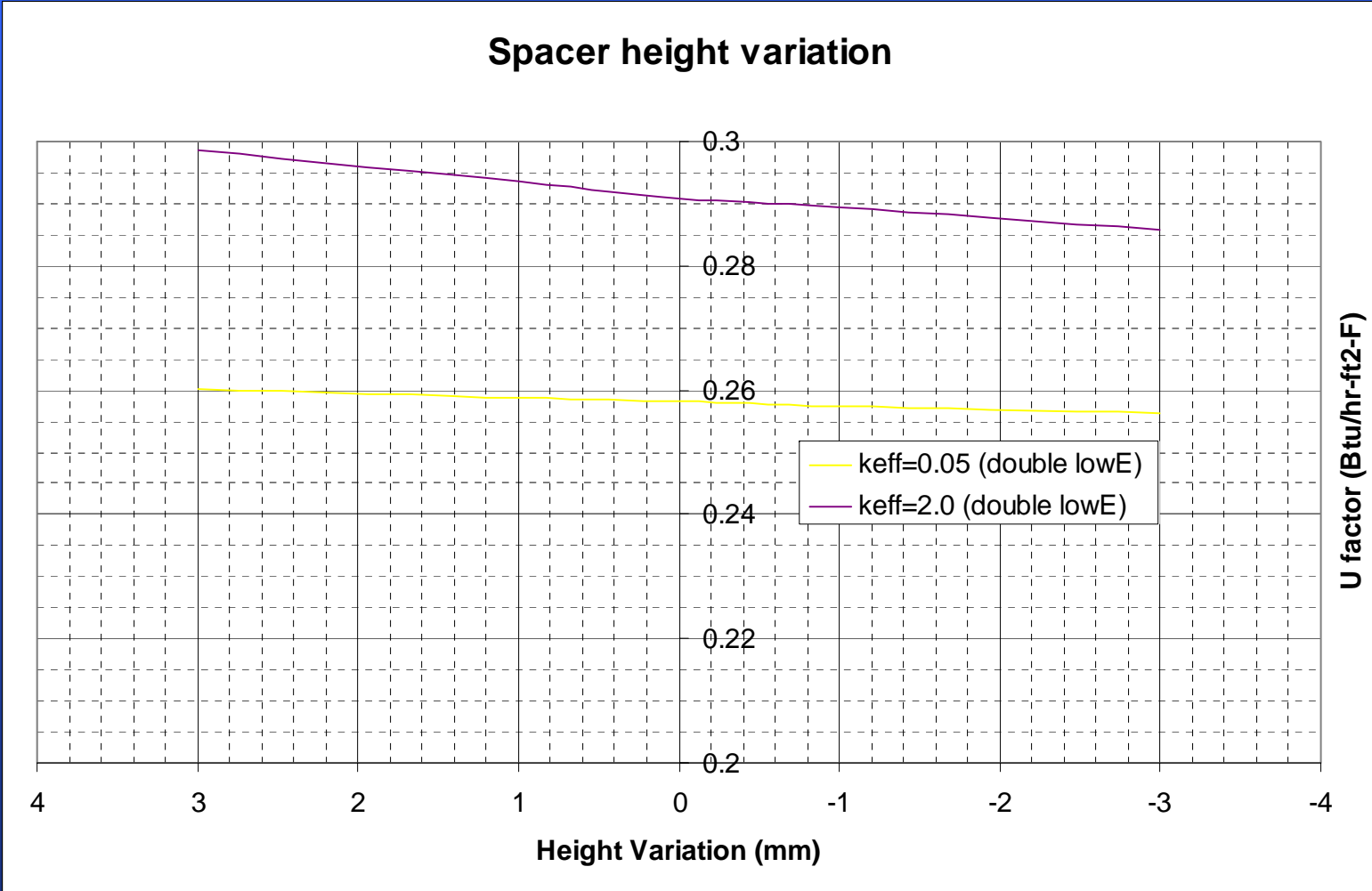


EFFECT OF SPACER HEIGHT: PVC DOUBLE CLEAR AIR

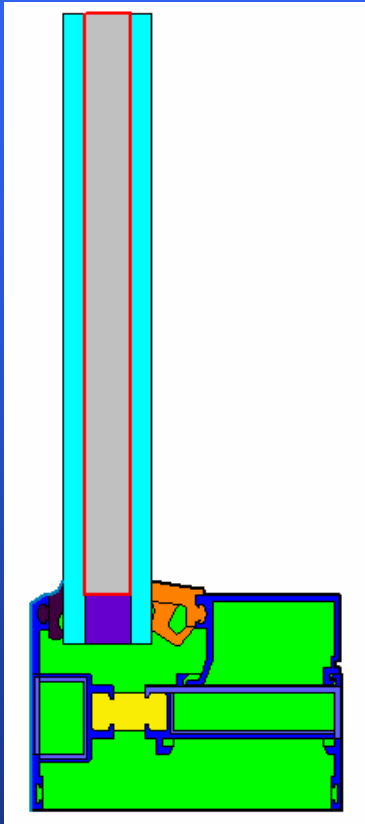
Spacer height variation



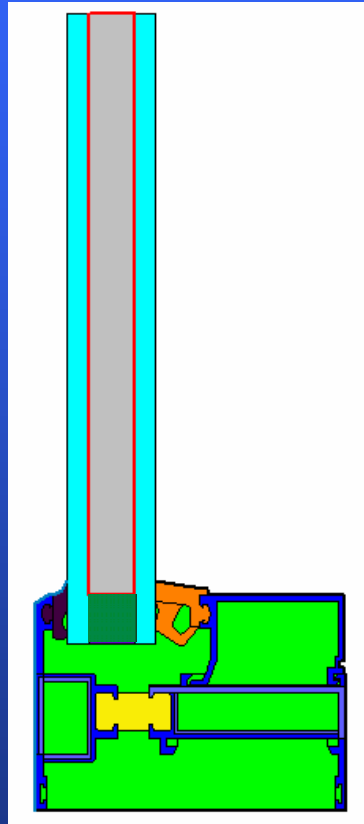
EFFECT OF SPACER HEIGHT: PVC DOUBLE LOW-E SC KRYPTON



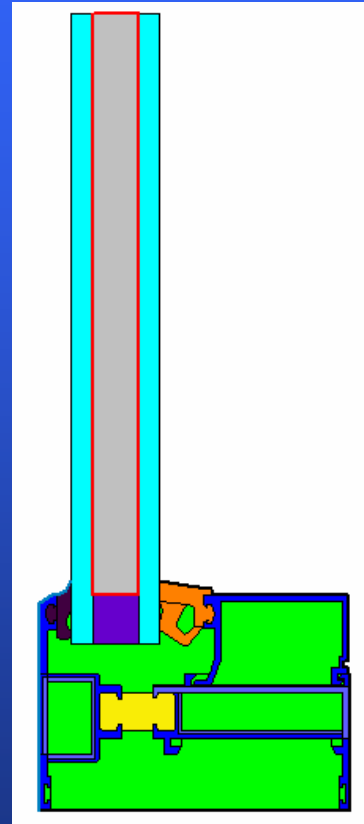
DEFINITION OF GENERIC BEST/WORST IGU AND SPACERS



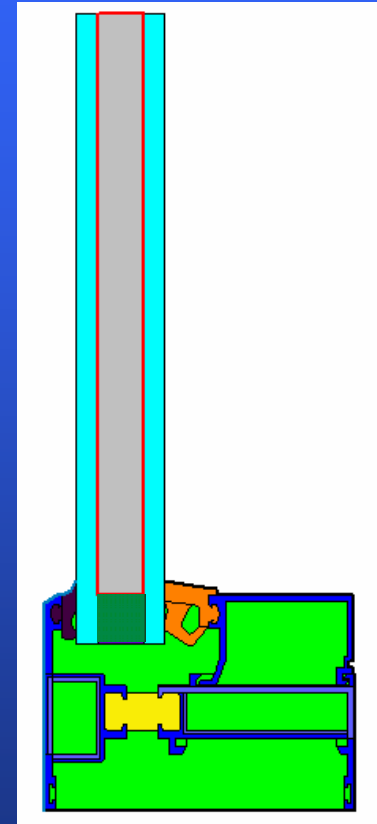
Worst IGU /
Worst Spacer



Worst IGU /
Best Spacer

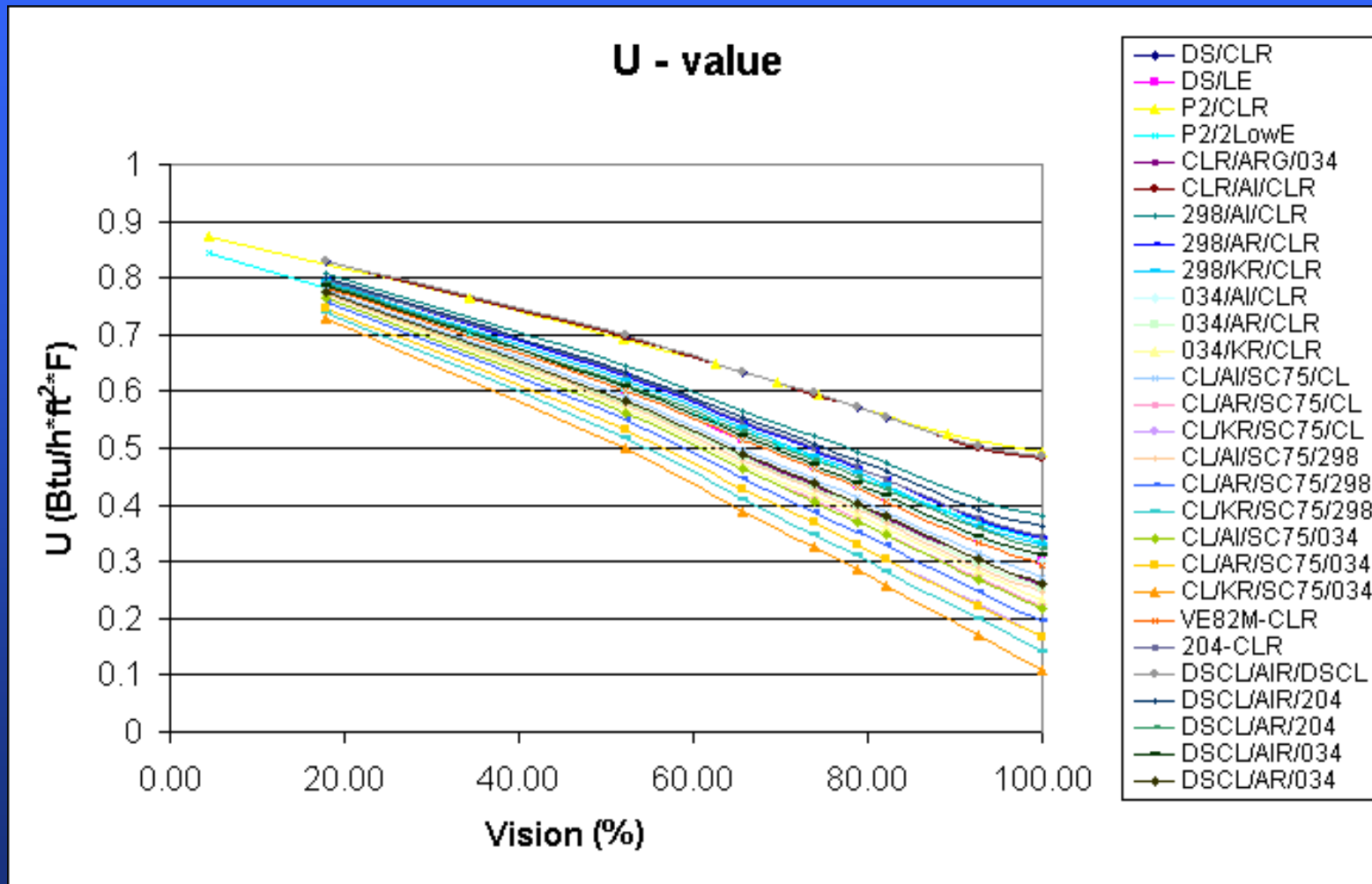


Best IGU /
Worst Spacer

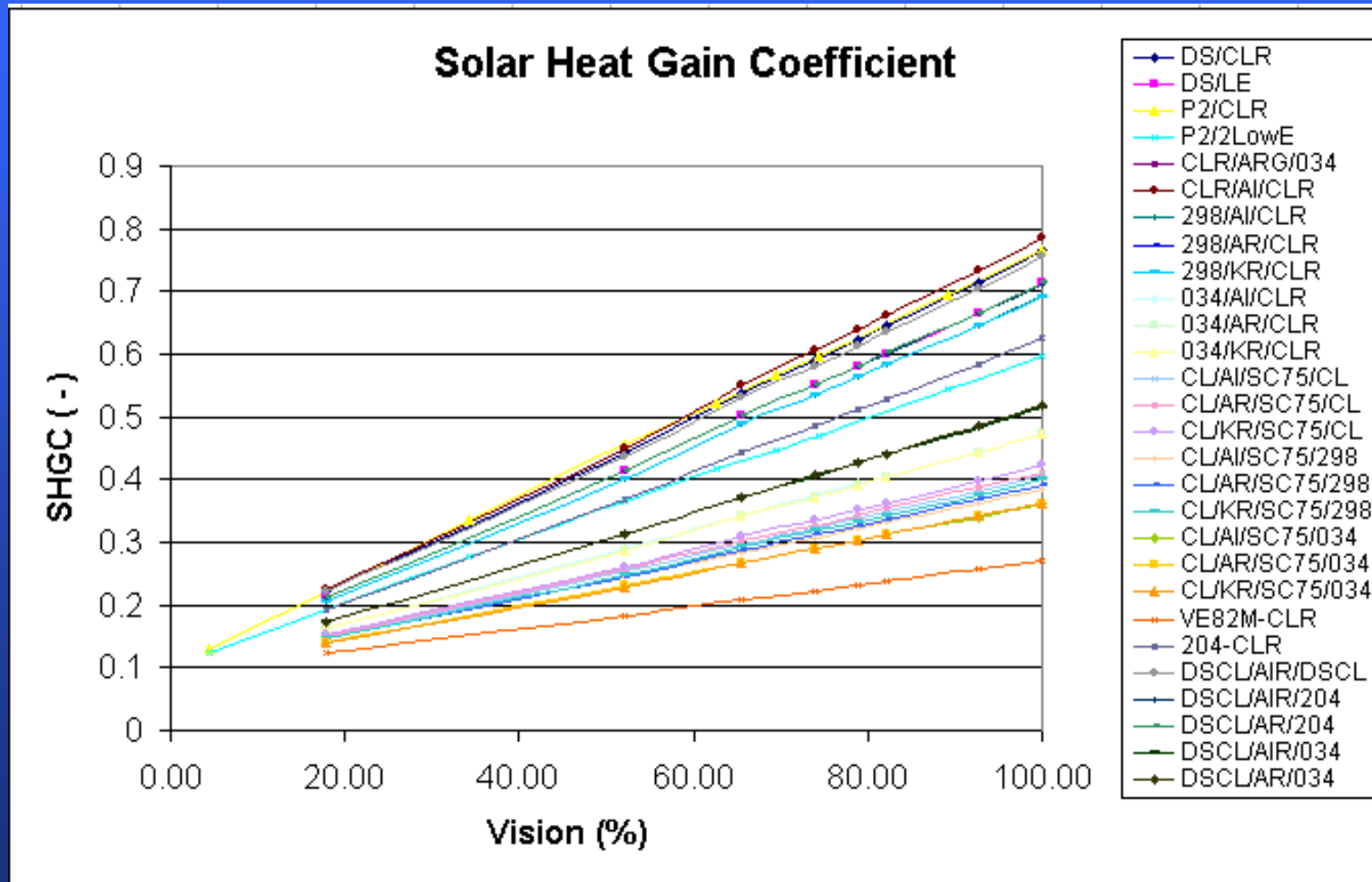


Best IGU / Best
Spacer

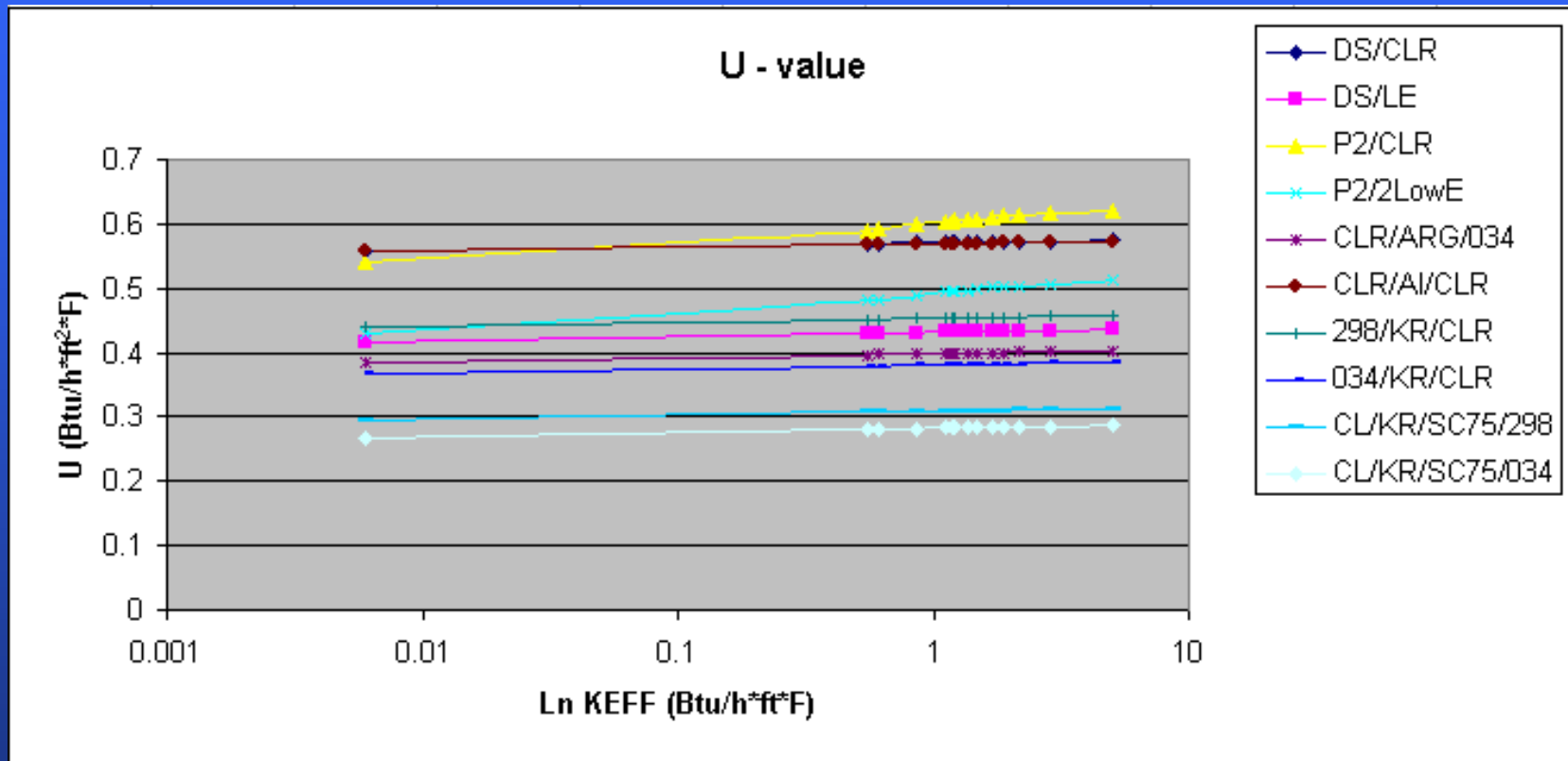
U-FACTOR INTERPOLATION CURVES



SHGC INTERPOLATION CURVES



SPACER INTERPOLATION CURVES



DEFINITION OF GENERIC BEST/WORST IGU AND SPACERS – PROPOSED VALUES

- Best Glazing: Double glazed, dual Low-e ($e=0.01$), Xenon fill
- Worst glazing: Double clear Air
- Best Spacer: $k_{\text{eff}} = 0.01 \text{ W/m-K}$ ($0.006 \text{ Btu/hr-ft-F}$)
- Worst spacer: $k_{\text{eff}} = 10.0 \text{ W/(m-K)}$ (5.8 Btu/hr-ft-F)
- Gap width standardized to $\frac{1}{2}$ "
- Glass thickness standardized to $\frac{1}{8}$ " for residential and $\frac{1}{4}$ " for commercial
- Spacer height standardized to $\frac{1}{2}$ "
- Triple and quadruple glazed can be handled by above configurations

CONDENSATION RESISTANCE

- At present CR is not part of CMA procedure
- Proposal:
 - Short term: for obtaining CR values use existing procedure of modeling each glazing and spacer option for which CR is requested
 - Long term: Propose research project to develop component modeling approach (CMA) for CR
- Look into the suitability of the current condensation resistance standard to meet needs of architectural community