

Comparison Between Simulation Results from THERM/WINDOW vs. new Non-Residential Component Modeling Approach:

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By: Dr. Charlie Curcija

For several examples (Aluminum, Thermally Broken Aluminum, Fiber-glass and Vinyl-reinforced frames) total product indices, U-factor, SHGC and VT, are determined using two methods; 1) current NFRC methodology of running THERM and WINDOW programs for each glazing and spacer option and window size; and 2) Component Modeling Approach from the recently approved Non-Residential procedure. Those results are labeled as T5/W5 and CMA, respectively and presented in series of tables and graphs. TRR-01, TRR-97, TRR-99 and TRR-02 are NFRC round robin results windows, Fiberglass and TR-4600 are additional products provided by their manufacturers.

Conclusion/ Observation:

For NFRC size, differences in U-factor are no greater than 0.01 Btu/hr-ft²-F, while for SHGC the differences are no greater than 0.001 Btu/hr-ft²-F. For VT there are no differences.

For sizes other than NFRC standard size, the differences in U-factor are no greater than 0.02 Btu/hr-ft²-F, while for SHGC they are no greater than 0.001 Btu/hr-ft²-F. Again, for VT the results are identical.

All of results are tabulated in Tables 1 through 6, followed by a series of 6 Graphs.

Table 1: TRR-01 - Thermally Broken frame Fix window-(Comparison Results)

Model	Glazing System	Spacer	Size (in)	U (Btu/h*ft ² *F)			SHGC (-)			VT (-)		
				T5/W5	CMA		T5/W5	CMA		T5/W5	CMA	
TRR-01	clr/ar/clr (7/8")	Allmetal Standard Aluminum (5/8")	36x24	0.532	0.527	-0.005	0.561	0.561	0.000	0.569	0.569	0.000
			48x36	0.510	0.507	-0.003	0.624	0.625	0.001	0.640	0.640	0.000
			47.244x59.055	0.494	0.497	0.003	0.657	0.658	0.001	0.678	0.678	0.000
			72x54	0.489	0.491	0.002	0.676	0.676	0.000	0.698	0.698	0.000
			96x72	0.476	0.483	0.007	0.702	0.703	0.001	0.728	0.728	0.000
		Edgetech S-class (5/8")	36x24	0.511	0.515	0.004	0.560	0.560	0.000	0.569	0.569	0.000
			48x36	0.494	0.498	0.004	0.624	0.624	0.000	0.640	0.640	0.000
			47.244x59.055	0.482	0.490	0.008	0.657	0.658	0.001	0.678	0.678	0.000
			72x54	0.478	0.485	0.007	0.675	0.676	0.001	0.698	0.698	0.000
	96x72		0.468	0.478	0.010	0.702	0.703	0.001	0.728	0.728	0.000	
	034/ar/clr (7/8")	Allmetal Standard Aluminum (5/8")	36x24	0.391	0.394	0.003	0.342	0.343	0.001	0.493	0.493	0.000
			48x36	0.352	0.354	0.002	0.379	0.379	0.000	0.555	0.555	0.000
			47.244x59.055	0.332	0.333	0.001	0.398	0.399	0.001	0.587	0.587	0.000
			72x54	0.320	0.321	0.001	0.409	0.409	0.000	0.605	0.605	0.000
			96x72	0.302	0.304	0.002	0.424	0.425	0.001	0.631	0.631	0.000
		Edgetech S-class (5/8")	36x24	0.373	0.378	0.005	0.342	0.342	0.000	0.493	0.493	0.000
			48x36	0.339	0.342	0.003	0.379	0.379	0.000	0.555	0.555	0.000
47.244x59.055			0.320	0.323	0.003	0.398	0.398	0.000	0.587	0.587	0.000	
72x54			0.310	0.313	0.003	0.408	0.409	0.001	0.605	0.605	0.000	
96x72	0.295		0.298	0.003	0.424	0.424	0.000	0.631	0.631	0.000		

Note: NFRC standardized dimensions are marked yellow.

Table 3: TRR-99 - Aluminum Horizontal Slider-(Comparison Results)

Model	Glazing System	Spacer	Size (in)	U (Btu/h*ft ² *F)			SHGC (-)			VT (-)		
				T5/W5	CMA		T5/W5	CMA		T5/W5	CMA	
TRR-99	clr/ar/clr (3/4")	Allmetal Standard Aluminum (1/2")	36x24	0.687	0.682	-0.005	0.630	0.630	0.000	0.643	0.643	0.000
			48x36	0.621	0.618	-0.003	0.674	0.674	0.000	0.693	0.693	0.000
			59.055x47.244	0.585	0.584	-0.001	0.697	0.697	0.000	0.720	0.720	0.000
			72x54	0.564	0.565	0.001	0.710	0.710	0.000	0.735	0.735	0.000
			96x72	0.532	0.537	0.005	0.728	0.729	0.001	0.756	0.756	0.000
		Edgetech S-class (1/2")	36x24	0.676	0.677	0.001	0.630	0.630	0.000	0.643	0.643	0.000
			48x36	0.613	0.614	0.001	0.674	0.674	0.000	0.693	0.693	0.000
			59.055x47.244	0.578	0.581	0.003	0.697	0.697	0.000	0.720	0.720	0.000
			72x54	0.558	0.562	0.004	0.710	0.710	0.000	0.735	0.735	0.000
	96x72		0.528	0.535	0.007	0.728	0.729	0.001	0.756	0.756	0.000	
	034/ar/clr (3/4")	Allmetal Standard Aluminum (1/2")	36x24	0.540	0.536	-0.004	0.384	0.385	0.001	0.557	0.557	0.000
			48x36	0.459	0.454	-0.005	0.409	0.410	0.001	0.600	0.600	0.000
			59.055x47.244	0.416	0.411	-0.005	0.423	0.423	0.000	0.623	0.623	0.000
			72x54	0.390	0.386	-0.004	0.430	0.430	0.000	0.636	0.636	0.000
			96x72	0.353	0.351	-0.002	0.441	0.441	0.000	0.655	0.655	0.000
		Edgetech S-class (1/2")	36x24	0.526	0.529	0.003	0.384	0.384	0.000	0.557	0.557	0.000
			48x36	0.449	0.449	0.000	0.409	0.410	0.001	0.600	0.600	0.000
59.055x47.244			0.407	0.407	0.000	0.422	0.423	0.001	0.623	0.623	0.000	
72x54			0.382	0.382	0.000	0.430	0.430	0.000	0.636	0.636	0.000	
96x72	0.347		0.348	0.001	0.440	0.441	0.001	0.655	0.655	0.000		

Note: NFRC standardized dimensions are marked yellow.

Table 4: TRR-02 - Thermally improved with bolts -Curtain wall -(Comparison Results)

Model	Glazing System	Spacer	Size (in)	U (Btu/h*ft ² *F)			SHGC (-)			VT (-)		
				T5/W5	CMA		T5/W5	CMA		T5/W5	CMA	
Curtain wall	clr/ar/clr (1")	Allmetal Standard Aluminum (3/4")	48x36	0.763	0.768	0.005	0.588	0.588	0.000	0.585	0.585	0.000
			59.055x47.244	0.702	0.708	0.006	0.627	0.627	0.000	0.631	0.631	0.000
			72x54	0.664	0.671	0.007	0.650	0.651	0.001	0.659	0.659	0.000
			96x72	0.611	0.621	0.010	0.683	0.683	0.000	0.698	0.698	0.000
		Edgetech S-class (3/4")	48x36	0.737	0.751	0.014	0.587	0.588	0.001	0.585	0.585	0.000
			59.055x47.244	0.681	0.694	0.013	0.626	0.627	0.001	0.631	0.631	0.000
			72x54	0.646	0.659	0.013	0.649	0.650	0.001	0.659	0.659	0.000
			96x72	0.597	0.612	0.015	0.682	0.683	0.001	0.698	0.698	0.000
	034/ar/clr (1")	Allmetal Standard Aluminum (3/4")	48x36	0.634	0.638	0.004	0.364	0.364	0.000	0.506	0.506	0.000
			59.055x47.244	0.561	0.564	0.003	0.385	0.386	0.001	0.547	0.547	0.000
			72x54	0.516	0.519	0.003	0.398	0.398	0.000	0.571	0.571	0.000
			96x72	0.453	0.457	0.004	0.416	0.416	0.000	0.605	0.605	0.000
		Edgetech S-class (3/4")	48x36	0.604	0.618	0.014	0.363	0.363	0.000	0.506	0.506	0.000
			59.055x47.244	0.536	0.548	0.012	0.384	0.385	0.001	0.547	0.547	0.000
			72x54	0.495	0.505	0.010	0.397	0.398	0.001	0.571	0.571	0.000
			96x72	0.437	0.446	0.009	0.415	0.416	0.001	0.605	0.605	0.000

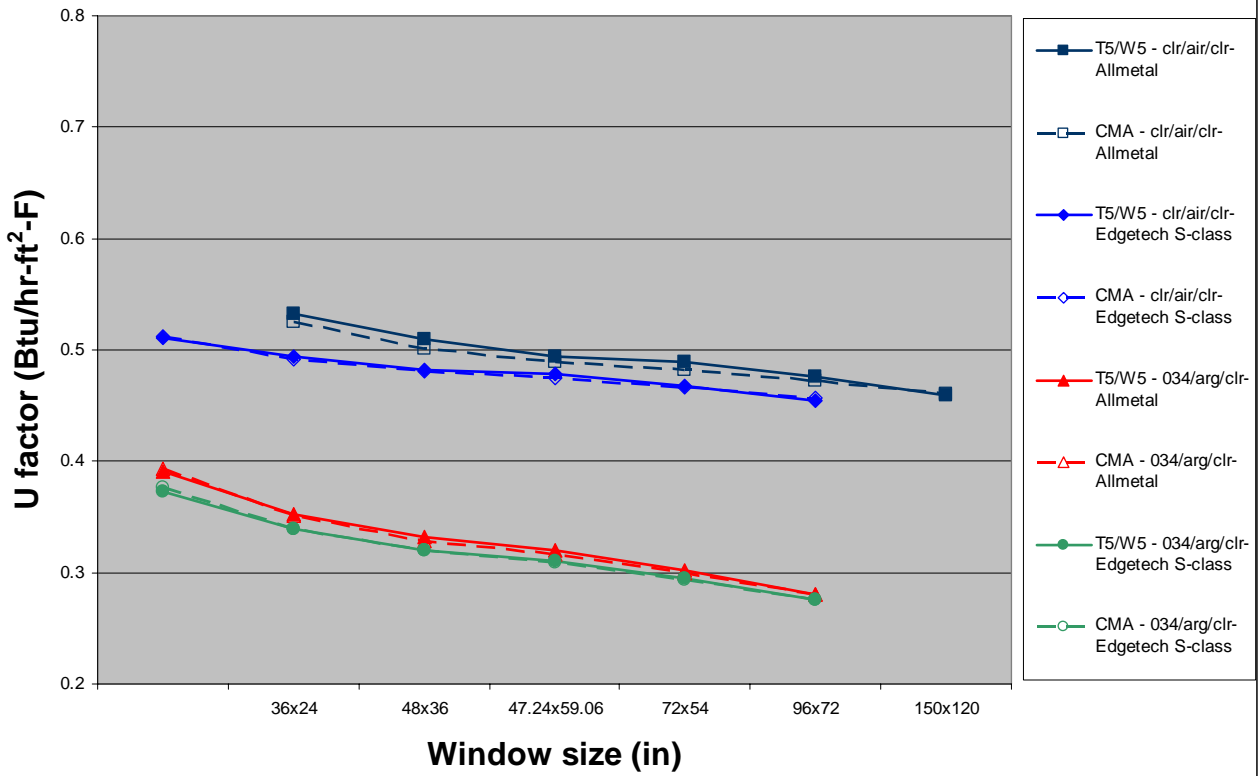
Note: NFRC standardized dimensions are marked yellow.

Table 5: Fiberglass Casement -(Comparison Results)

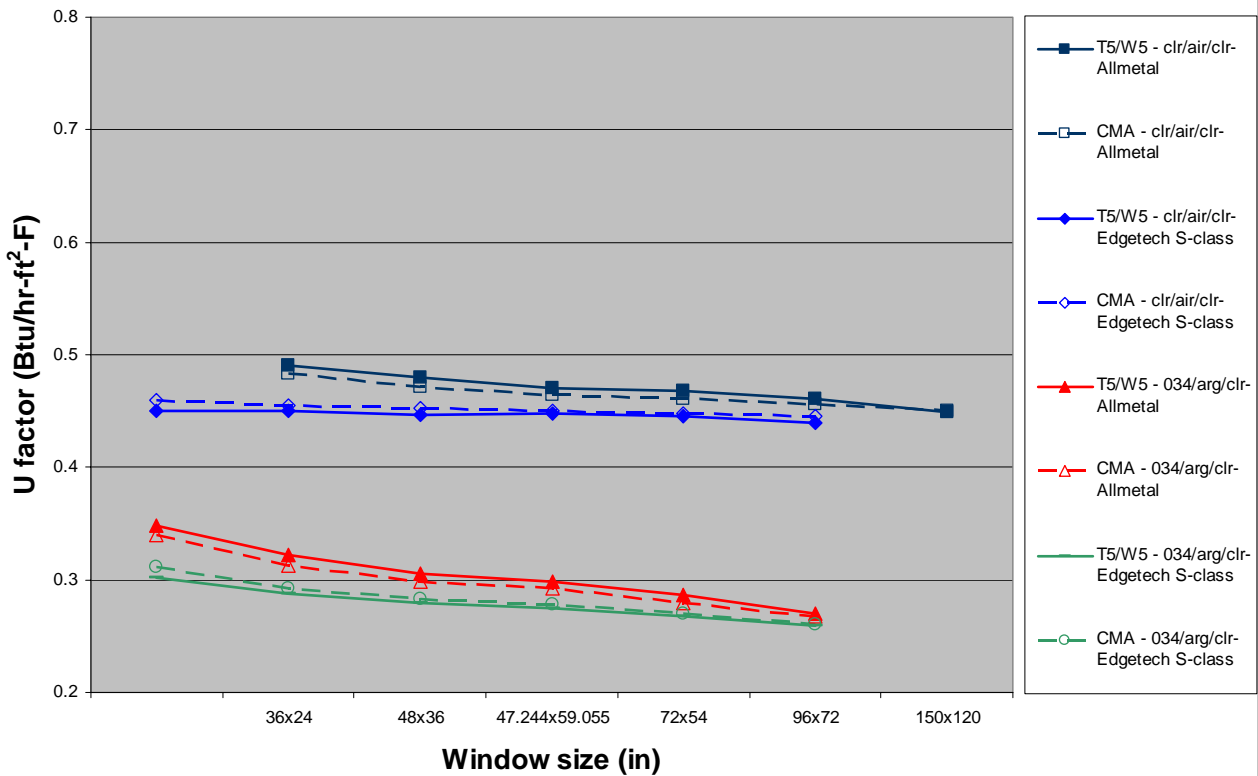
Model	Glazing System	Spacer	Size (in)	U (Btu/h* ² *F)			SHGC (-)			VT (-)		
				T5/W5	CMA		T5/W5	CMA		T5/W5	CMA	
Fiberglass	clr/ar/clr (1")	Allmetal Standard Aluminum (3/4")	36x24	0.452	0.448	-0.004	0.521	0.521	0.000	0.534	0.534	0.000
			23.622x59.055	0.452	0.449	-0.003	0.553	0.553	0.000	0.569	0.569	0.000
			48x36	0.454	0.451	-0.003	0.595	0.595	0.000	0.614	0.614	0.000
			72x54	0.452	0.454	0.002	0.655	0.656	0.001	0.680	0.680	0.000
			96x72	0.449	0.456	0.007	0.687	0.687	0.000	0.714	0.714	0.000
		Edgetech S-class (3/4")	36x24	0.428	0.435	0.007	0.520	0.520	0.000	0.534	0.534	0.000
			23.622x59.055	0.430	0.438	0.008	0.552	0.553	0.001	0.569	0.569	0.000
			48x36	0.436	0.442	0.006	0.594	0.595	0.001	0.614	0.614	0.000
			72x54	0.440	0.448	0.008	0.655	0.656	0.001	0.680	0.680	0.000
			96x72	0.440	0.451	0.011	0.686	0.687	0.001	0.714	0.714	0.000
	034/ar/clr (1")	Allmetal Standard Aluminum (3/4")	36x24	0.332	0.324	-0.008	0.316	0.316	0.000	0.462	0.462	0.000
			23.622x59.055	0.326	0.316	-0.010	0.335	0.335	0.000	0.493	0.493	0.000
			48x36	0.313	0.306	-0.007	0.360	0.360	0.000	0.532	0.532	0.000
			72x54	0.295	0.291	-0.004	0.395	0.395	0.000	0.589	0.589	0.000
			96x72	0.285	0.283	-0.002	0.414	0.414	0.000	0.618	0.618	0.000
		Edgetech S-class (3/4")	36x24	0.302	0.308	0.006	0.315	0.315	0.000	0.462	0.462	0.000
			23.622x59.055	0.299	0.302	0.003	0.334	0.335	0.001	0.493	0.493	0.000
			48x36	0.290	0.294	0.004	0.359	0.359	0.000	0.532	0.532	0.000
			72x54	0.279	0.283	0.004	0.395	0.395	0.000	0.589	0.589	0.000
			96x72	0.273	0.277	0.004	0.413	0.414	0.001	0.618	0.618	0.000

Note: NFRC standardized dimensions are marked yellow.

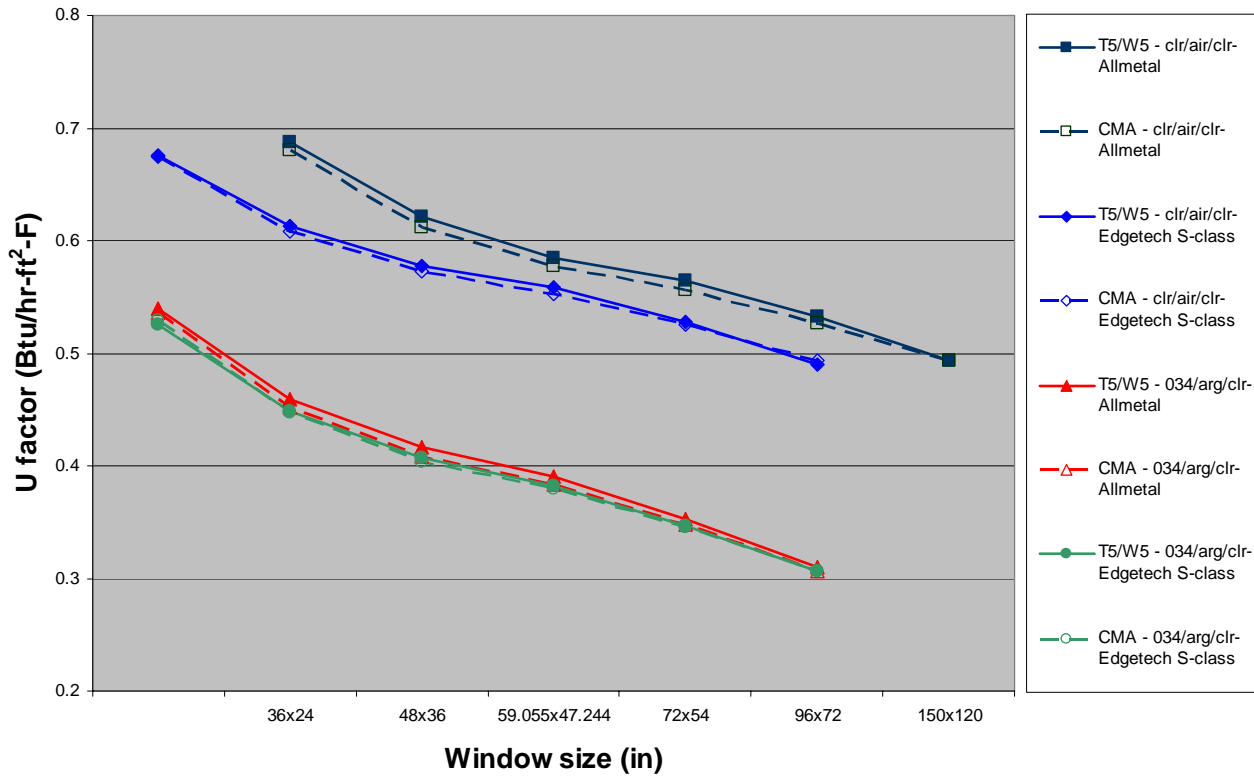
TRR01 (TB AI - Fixed Casement)



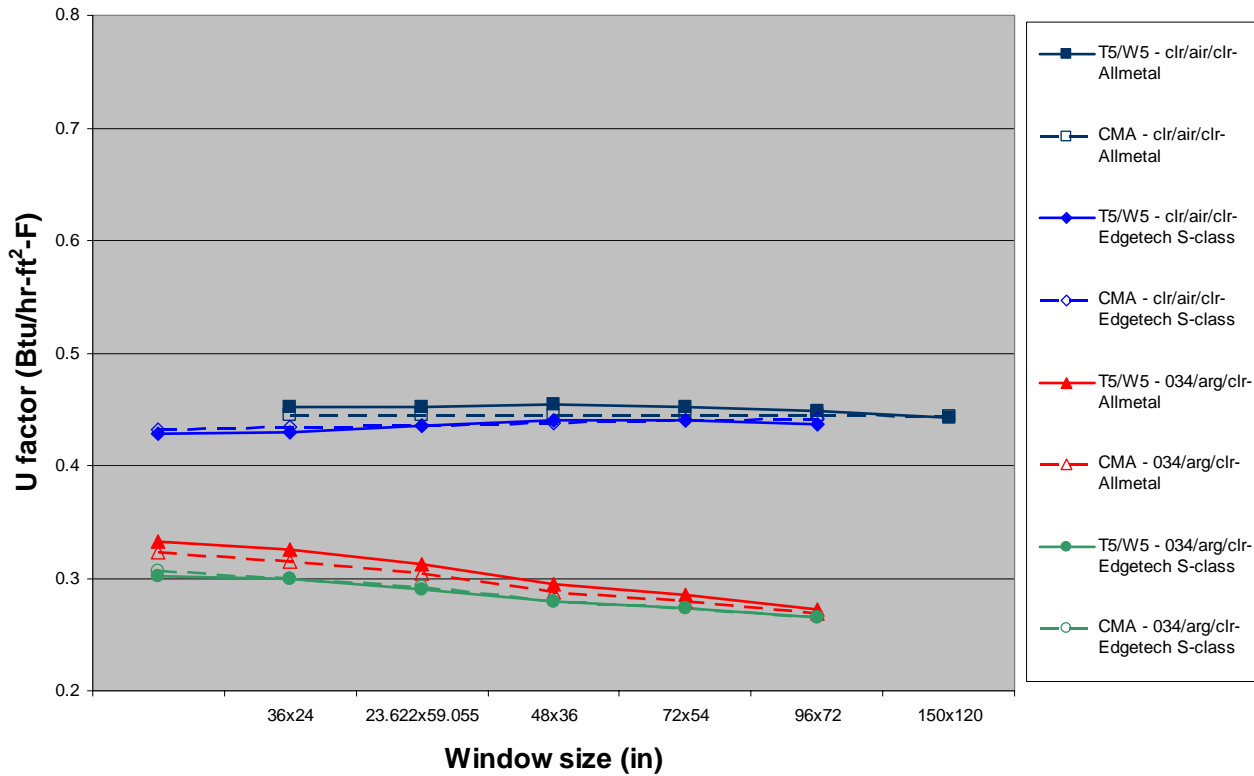
TRR97 (Wood- Fixed Casement)



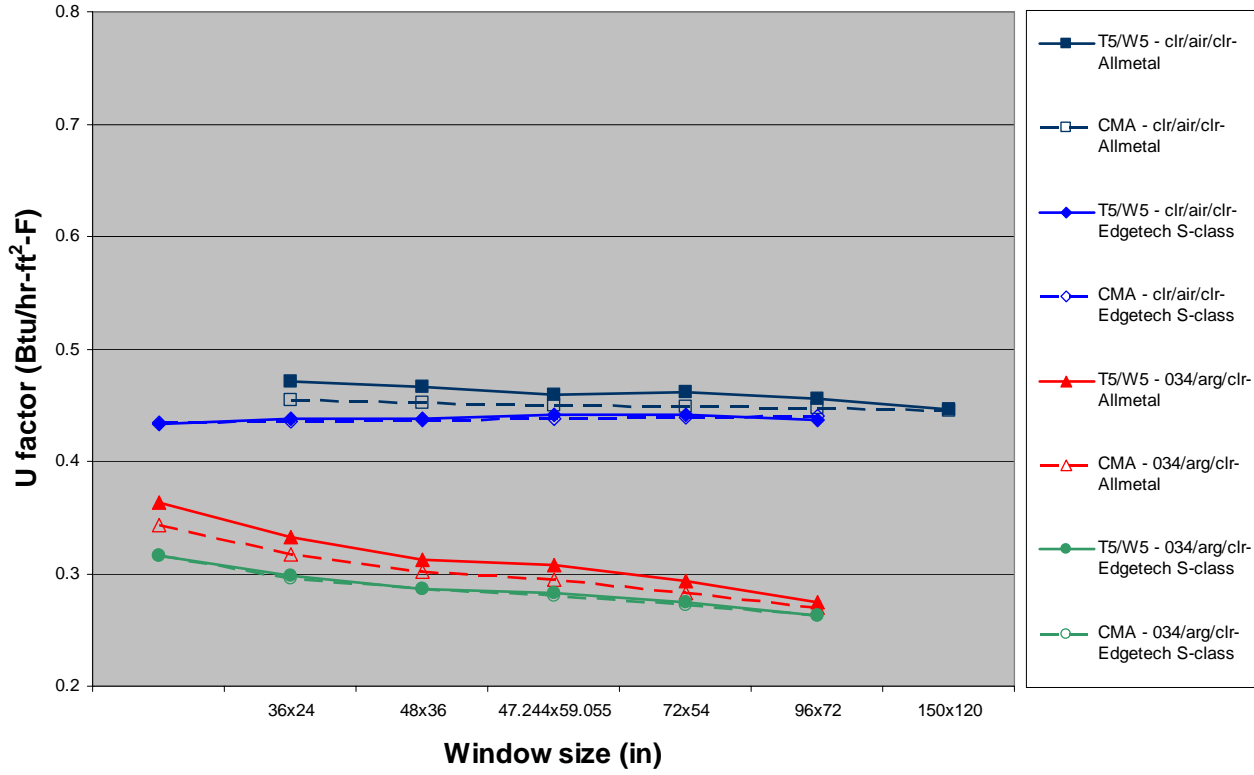
TRR99 (Al- Horizontal slider)



GR (Fiberglass- Casement)



TR4600 (Reinforced PVC - Double Hung)



Curtain Wall

