– DOW-KNIGHT CI-SYSTEM™ THERMAL SUMMARY–

KNIGHT WALL SYSTEMS

– 3D THERMAL MODELING RESULTS OVERVIEW:

With 95%-98% exterior insulation effectiveness, the DOW-Knight CI-System easily meets the requirements of ASHRAE 90.1-2007/2010 with only 1.55" of exterior rigid board insulation paired with 1.5" of SPF interior insulation. The DOW-Knight CI-System has effectively continuous exterior insulation with only thermally isolated fasteners bypassing the exterior thermal insulation, meeting ASHRAE's definition of *ci*, or continuous insulation. The isolators on the fasteners prevents lateral heat flow to the steel girts to reduce fin effects. From previous modeling, these fin effects typically reduce the system by an additional R-1.

– MODELED ASSEMBLY DETAILS:

- ½" interior drywall
- 6" steel studs @ 16" O.C.
- 1.5" DOW SPF – CM Series (R-9.8)
- DOW THERMAX (ci) Exterior Insulation
- CI-System attachment system
  - fastened 16" O.C. vertically

Clear Wall Effective R-Values

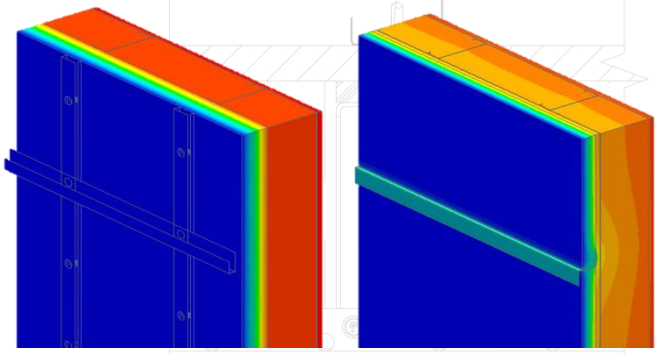
With 1.5" DOW Spray Foam (CM Series)

Insulation Thickness (inches)	Nominal Exterior Insulation R-Value (ft²·°F·hr/BTU)	Nominal Interior Insulation R-Value (ft²·°F·hr/BTU)	Nominal Entire Assembly R-Value (ft²·°F·hr/BTU)	Continuous Vertical Girts 16" O.C.		Continuous Horizontal Girts 24" O.C.		KWS CI-System	
1.55	10.1	9.8	22.6	11.6	(0.086)	15.2	(0.066)	18.8	(0.053)
2.0	13.0	9.8	25.5					*21.4*	*(0.048)*
2.5	15.8	9.8	28.3					*24.1*	*(0.041)*
3.0	19.0	9.8	31.5					27.0	(0.037)
Without Spray Foam									
1.55	10.1	0	12.8	8.4	(0.118)	9.5	(0.105)	12.5	(0.080)
2.0	13.0	0	15.7					*15.2*	*(0.066)*
2.5	15.8	0	18.5					*17.8*	*(0.056)*
3.0	19.0	0	21.7					20.7	(0.048)

The modeled 1.55" & 3" cases showed a near constant effective thermal resistance percentage, therefore italicized results shown above were extrapolated from between the modeled 1.55" & 3" case results.

– ABOUT THE 3D THERMAL MODELING:

For the 3D thermal analysis, Knight Wall used the expert services provided by Morrison-Hershfield. The CAD/FEA analysis software NX, from Siemens was used for the actual modeling. Using this software, MH had previously conducted a research project for the American Society of Heating, Cooling, Refrigeration and Air-Conditioning Engineers (ASHRAE) in which a 3D thermal model was developed and calibrated to within 5% of hotbox measurements. Please feel free to contact Knight Wall Systems for the full report.



Knight CI-System | Horizontal Z-Girt

– THERMAL SUMMARY –