

# - KNIGHT MFI-SYSTEM™ THERMAL SUMMARY -



## - 3D THERMAL MODELING RESULTS OVERVIEW:

With 80%-95% exterior insulation effectiveness, the Knight Wall MFI-System easily meets the requirements of ASHRAE 90.1-2007/2010 in all climate zones with only 3.5" of exterior mineral wool insulation without the need for interior insulation. For split assemblies with the Knight Wall MFI-System on the exterior, adding R-19 interior batt insulation in the stud cavity adds, approximately, R-8.3 and R-15.4 to the effective thermal resistance for steel stud and wood frame assemblies respectively. Note that there are other considerations (such as condensation risk) which should be accounted for when using split insulated assemblies.



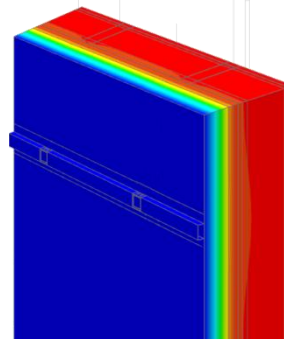
## - MODELED ASSEMBLY DETAILS:

- α ½" interior drywall
- α 6" studs @ 16" O.C.
- α ½" exterior sheathing
- α R4.2/in mineral wool insulation
- α ThermaBrackets @ 24" O.C. vertically

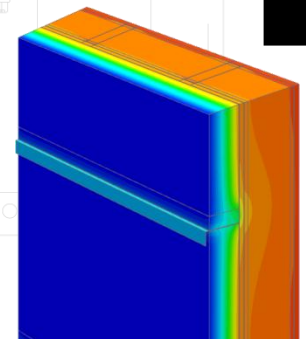
Clear Wall Effective R-Values							
Steel Stud Substrate							
Insulation Thickness (inches)	Nominal Exterior Insulation R-Value (ft <sup>2</sup> ·°F·hr/BTU)	Nominal Interior Insulation R-Value (ft <sup>2</sup> ·°F·hr/BTU)	Nominal Entire Assembly R-Value (ft <sup>2</sup> ·°F·hr/BTU)	Continuous Vertical Girts 16" O.C.	Continuous Horizontal Girts 24" O.C.	Knight Wall MFI-System Brackets 24" O.C.	
2.0	8.4	0	11.9	7.8 (0.128)	8.7 (0.115)	10.8 (0.093)	
3.0	12.6	0	16.1	9.2 (0.109)	10.6 (0.095)	14.1 (0.071)	
3.5	14.7	0	18.2	9.7 (0.103)	11.4 (0.088)	15.7 (0.064)	
4.0	16.8	0	20.3	10.3 (0.097)	12.2 (0.082)	17.2 (0.058)	
5.0	21.0	0	24.5	11.3 (0.089)	13.5 (0.074)	20.1 (0.050)	
6.0	25.2	0	28.7	12.0 (0.083)	14.7 (0.068)	22.7 (0.044)	
Wood Stud Substrate							
2.0	8.4	0	11.9	8.4 (0.119)	9.1 (0.110)	11.1 (0.090)	
3.0	12.6	0	16.1	9.9 (0.101)	11.0 (0.091)	14.6 (0.069)	
3.5	14.7	0	18.2	10.5 (0.095)	11.8 (0.084)	16.2 (0.062)	
4.0	16.8	0	20.3	11.1 (0.090)	12.6 (0.079)	17.8 (0.056)	
5.0	21	0	24.5	12.0 (0.083)	14.1 (0.071)	20.8 (0.048)	
6.0	25.2	0	28.7	13.1 (0.077)	15.4 (0.065)	23.6 (0.042)	
KWS MFI-System with Batt Insulation				Steel Studs	Wood Studs		
2.0	8.4	19	30.9	19.2 (0.052)	26.4 (0.038)		
3.0	12.6	19	35.1	22.5 (0.045)	29.9 (0.033)		
3.5	14.7	19	37.2	23.8 (0.042)	31.6 (0.032)		
4.0	16.8	19	39.3	25.4 (0.039)	33.2 (0.030)		
5.0	21.0	19	43.5	28.2 (0.035)	36.3 (0.028)		
6.0	25.2	19	47.7	30.8 (0.032)	39.2 (0.025)		

## - ABOUT THE 3D MODELING:

For the 3D thermal analysis, Knight Wall used the expert services provided by Morrison-Hersfield. 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 MFI-System



Horizontal Z-Girt

- THERMAL SUMMARY -