

Installed over 3-5/8" or 4" Metal Stud

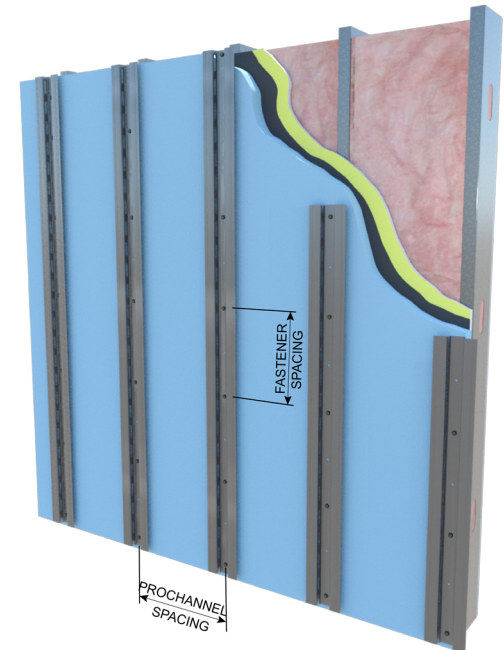
Wall Assembly				Exterior Insulation Thickness			
Wall Cavity	Exterior Insulation	Horizontal On-Center Spacing	Vertical On-Center Spacing	2"		4"	
				U-Value	R-Value	U-Value	R-Value
Uninsulated	Polystyrene	16"	6"	0.079	12.7	0.048	20.7
			12"	0.077	13.0	0.046	21.9
			18"	0.076	13.1	0.045	22.4
		24"	6"	0.078	12.9	0.047	21.5
			12"	0.076	13.1	0.045	22.4
			18"	0.076	13.2	0.044	22.7
R-19 Cavity Insulation	Polystyrene	16"	6"	0.050	20.0	0.036	28.2
			12"	0.049	20.3	0.034	29.4
			18"	0.049	20.4	0.034	29.9
		24"	6"	0.046	21.6	0.033	30.3
			12"	0.046	21.8	0.032	31.2
			18"	0.046	21.9	0.032	31.5

Installed over 6" Metal Stud

Wall Assembly				Exterior Insulation Thickness			
Wall Cavity	Exterior Insulation	Horizontal On-Center Spacing	Vertical On-Center Spacing	2"		4"	
				U-Value	R-Value	U-Value	R-Value
Uninsulated	Polystyrene	16"	6"	0.079	12.7	0.048	20.7
			12"	0.077	13.0	0.046	21.9
			18"	0.076	13.1	0.045	22.4
		24"	6"	0.078	12.9	0.047	21.5
			12"	0.076	13.1	0.045	22.4
			18"	0.076	13.2	0.044	22.7
R-19 Cavity Insulation	Polystyrene	16"	6"	0.045	22.1	0.033	30.4
			12"	0.045	22.4	0.032	31.7
			18"	0.044	22.6	0.031	32.1
		24"	6"	0.041	24.5	0.030	33.5
			12"	0.040	24.7	0.029	34.3
			18"	0.040	24.8	0.029	34.6

Notes:

- For horizontally installed ProChannel Ci include two fasteners at the outer flanges of the channel which are approximately 3-1/2 inch apart.
- The thermal performance of the wall assemblies was evaluated by 3D thermal simulations.
- The thermal solver and modeling procedures utilized for this study were extensively calibrated and validated to within +/- 5% of hotbox testing for ASHRAE Research Project Report RP-1365.
- Large enclosed air spaces greater than 1/2 inch in depth, such as stud cavities, were simulated with an equivalent thermal conductivity of the air that includes the impacts of convection and radiation within the enclosure. Calculations for this equivalent conductivity were based on 2017 ASHRAE Handbook - Fundamentals.
- Interior/exterior air films were taken from 2017 ASHRAE Handbook – Fundamentals depending on surface orientation. The exterior air films were based on an exterior wind speed of 15 mph.
- Contact resistances between materials were simulated following procedures outlined in ASHRAE Research Project Report RP-1365.
- Insulation and other components were considered tight to adjacent interfaces.
- The clear field transmittances included in this analysis include repeating thermal bridges such as studs, girts, and fasteners.
- The wall assemblies were evaluated over a temperature index, for full limitations of this modeling approach, see ASHRAE Research Project Report RP-1365.



Installed over 2x4 Wood Framed

Wall Assembly				Exterior Insulation Thickness			
Wall Cavity	Exterior Insulation	Horizontal On-Center Spacing	Vertical On-Center Spacing	2"		4"	
				U-Value	R-Value	U-Value	R-Value
Uninsulated	Polystyrene	16"	6"	0.079	12.7	0.048	20.7
			12"	0.077	13.0	0.046	21.9
			18"	0.076	13.1	0.045	22.4
		24"	6"	0.078	12.9	0.047	21.5
			12"	0.076	13.1	0.045	22.4
			18"	0.076	13.2	0.044	22.7
R-19 Cavity Insulation	Polystyrene	16"	6"	0.043	23.1	0.032	31.1
			12"	0.043	23.4	0.031	32.3
			18"	0.043	23.5	0.030	32.8
		24"	6"	0.042	23.8	0.031	32.4
			12"	0.042	24.0	0.030	33.3
			18"	0.041	24.1	0.030	33.6

Installed over 2x6 Wood Framed

Wall Assembly				Exterior Insulation Thickness			
Wall Cavity	Exterior Insulation	Horizontal On-Center Spacing	Vertical On-Center Spacing	2"		4"	
				U-Value	R-Value	U-Value	R-Value
Uninsulated	Polystyrene	16"	6"	0.079	12.7	0.048	20.7
			12"	0.077	13.0	0.046	21.9
			18"	0.076	13.1	0.045	22.4
		24"	6"	0.078	12.9	0.047	21.5
			12"	0.076	13.1	0.045	22.4
			18"	0.076	13.2	0.044	22.7
R-19 Cavity Insulation	Polystyrene	16"	6"	0.035	28.5	0.027	36.5
			12"	0.035	28.8	0.027	37.7
			18"	0.035	28.9	0.026	38.2
		24"	6"	0.034	29.5	0.026	38.1
			12"	0.034	29.7	0.026	39.0
			18"	0.034	29.8	0.025	39.3

Notes:

- For horizontally installed ProChannel Ci include two fasteners at the outer flanges of the channel which are approximately 3-1/2 inch apart.
- The thermal performance of the wall assemblies was evaluated by 3D thermal simulations.
- The thermal solver and modeling procedures utilized for this study were extensively calibrated and validated to within +/- 5% of hotbox testing for ASHRAE Research Project Report RP-1365.
- Large enclosed air spaces greater than 1/2 inch in depth, such as stud cavities, were simulated with an equivalent thermal conductivity of the air that includes the impacts of convection and radiation within the enclosure. Calculations for this equivalent conductivity were based on 2017 ASHRAE Handbook - Fundamentals.
- Interior/exterior air films were taken from 2017 ASHRAE Handbook – Fundamentals depending on surface orientation. The exterior air films were based on an exterior wind speed of 15 mph.
- Contact resistances between materials were simulated following procedures outlined in ASHRAE Research Project Report RP-1365.
- Insulation and other components were considered tight to adjacent interfaces.
- The clear field transmittances included in this analysis include repeating thermal bridges such as studs, girts, and fasteners.
- The wall assemblies were evaluated over a temperature index, for full limitations of this modeling approach, see ASHRAE Research Project Report RP-1365.

