

Plasti-Fab Design Manual

Cathedral Ceiling Insulation



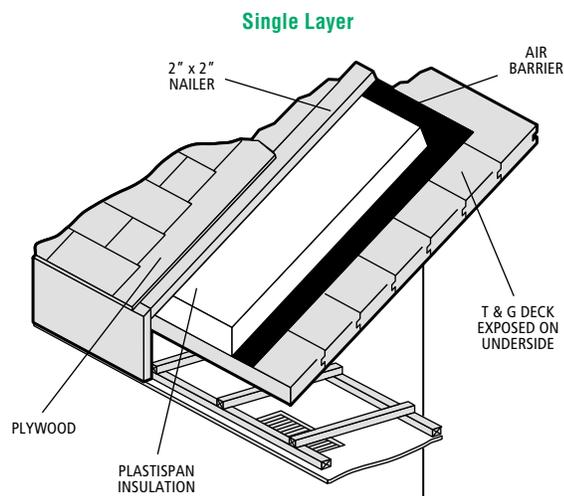
Better building ideas from PFB ™

Plasti-Fab™ EPS PRODUCT SOLUTIONS **PlastiSpan™ Insulation**

Cathedral Ceilings

The roof area can be the area of highest heat loss in buildings. In order to conserve energy and to make buildings more comfortable, building codes stipulate higher thermal resistances (R-Values) for the roof area compared to other building components.

On traditional cathedral ceilings where tongue and groove timber exposed on the inside is used as an architectural feature, Plasti-Fab PlastiSpan insulation board is ideal for both single and double layered applications. Newer construction methods for cathedral ceilings using sheathing and rafters finished on the interior with gypsum board may not always allow space for sufficient insulation. This type of roof construction can be insulated above the roof sheathing using PlastiSpan insulation to provide virtually any required thermal resistance while still allowing for the normal choices of exterior roof finishes.



Thermal Resistance Of Cathedral Ceiling Roofs With PlastiSpan Insulation

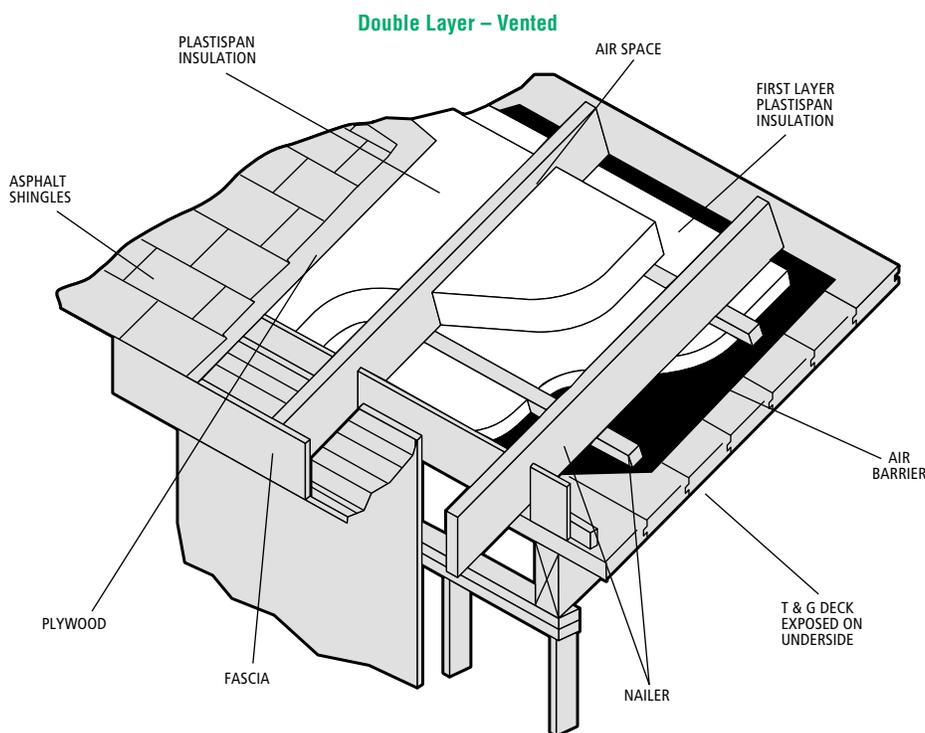
SI Values ("RSI")	PlastiSpan Thickness	Wood Deck Thickness		
		38 mm	64 mm	89 mm
	65 mm	2.15	2.38	2.59
	75 mm	2.41	2.63	2.85
	100 mm	3.06	3.29	3.50
	125 mm	3.71	3.94	4.15
	150 mm	4.36	4.59	4.80
	200 mm	5.66	5.89	6.10

*Add RSI 0.26 for every 10 mm of PlastiSpan over 200 mm

Imperial Values ("R")	PlastiSpan Thickness	Wood Deck Thickness		
		1.5"	2.5"	3.5"
	2.5"	12.04	13.29	14.54
	3"	13.91	15.16	16.41
	4"	17.66	18.91	20.16
	5"	21.41	22.66	23.91
	6"	25.16	26.41	27.66
	8"	32.66	33.91	35.16

*Add R 3.75 for every 1" of PlastiSpan over 8"

All Thermal Resistances calculated using principles published in ASHRAE Handbook of Fundamentals. Values for roof construction above include inside air film, deck insulation and outside air film, but ignoring sheathing and shingles above ventilated air space. Thermal Resistance of concrete or metal tiles can be ignored so tables will apply to these finishes also.



Application

General application instructions can be found in the specification section of the PlastiSpan brochure "Roof & Deck Insulation: Selection, Application and Specification."

The following instructions apply specifically to cathedral ceilings where the roof insulation is placed on the exterior side of the roof sheathing.

Cut insulation stops, fascia board and nailers to suit the thickness of insulation and any requirement for ventilated space.

Nail insulation stops onto fascia board around the roof and at valleys or ridges. If the space between the nailers is ventilated, ensure that the insulation stops or the fascia do not interfere with the air flow to and from louvers.

Place sheathing paper or other air barrier over the roof deck if required.

Single Layer

Place PlastiSpan insulation over the roof deck joints staggered and tightly butted.

Place nailers over the insulation spaced to support the roof sheathing.

OR

Place nailers into routed grooves in insulation to provide flush surface on ventilated space.

Fasten nailers through insulation to roof deck.

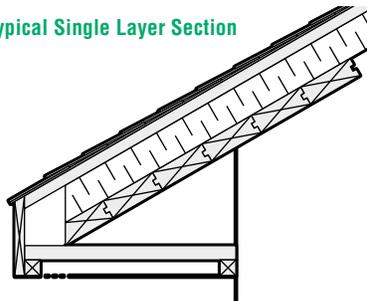
Double Layer

Use nailers the same thickness as the first layer of insulation;

OR

Use nailer to fit routed groove in insulation to provide flush surface.

Typical Single Layer Section



Lay nailer, then insulation, then nailer up the slope of the roof, all joints tightly butted.

Fasten nailer to deck as work proceeds.

Lay second layer of insulation perpendicular to first layer.

Lay insulation with joints tightly butted. Lay nailers over insulation spaced to support roof sheathing;

OR

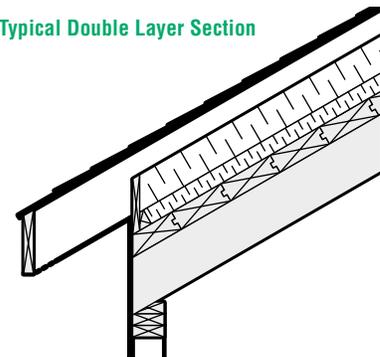
Lay nailers into routed grooves in insulation to provide flush surface or ventilated space;

OR

Lay first row of insulation then nailer, then second row of insulation progressively across the roof.

Fasten second layer nailer to first layer nailer where they intersect.

Typical Double Layer Section



Multiple Layers

If the thermal resistance requires extra layers of insulation, add layers to the bottom of the system changing the nailer direction as required.

Finish

Nail roof sheathing to nailers taking care that air movement is unobstructed in ventilation space.

Install roof covering in accordance with manufacturer's instructions.

Specification

Roof Covering

Install in accordance with manufacturer's instruction.