Insulation Material Analysis

Type of Material [A]	R-Value	Approximate Price [B]	Coverage by sq. ft.	Value $ per sq. ft.	Specific Product
Cellulose Insulation	19	6.25	40	0.15625	Low Dust Cellulose Blow-in Insulation
Rock wool - Mineral Wool Insulation	30	52.95	29.9	1.77090301	Roxul Wood Stud Unfaced Rock Wool Batt Insulation with Sound Barrier
Fiberglass Insulation	38	112.50	63.33	1.776369809	Cathedral Insulation Kraft Faced Batts high-density

Tickmark

A From Department of Energy 'https://energy.gov/energysaver/insulation-materials'

B Price, R-value and coverage are from Home depot and Lowe's.

Chart to compare the R-values

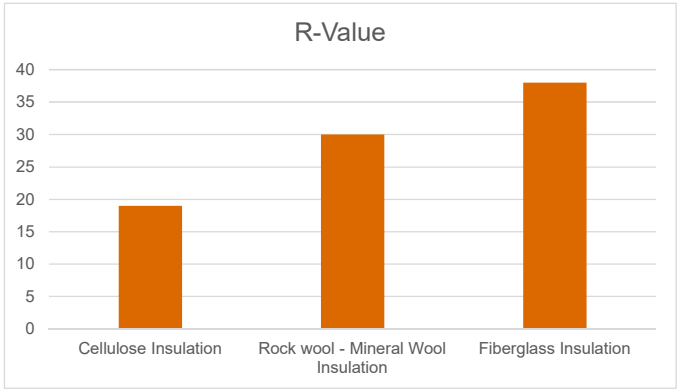
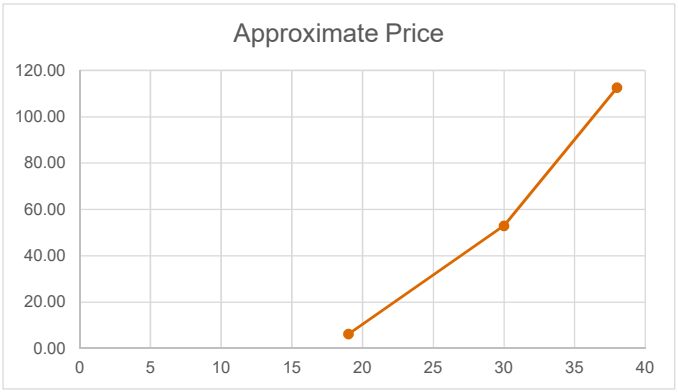
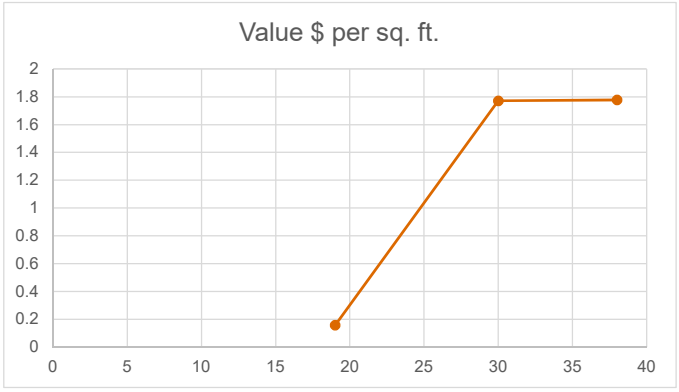


Chart to compare the prices

Scatterplot between the R-Value and the price





Conclusion

Based on the analysis above with three typical insulation materials, the relationship between the R-value and price of construction is correlative with the higher the R-value, the higher the price.

Window Assembly Analysis

Type of Window Assembly [A]	U Value	Approximate Price	Frame Material	Size	Value	Specific Product
Double Hung Windows	0.3	148.00	vinyl	1,899	0.08	ThermaStar by Pella Vinyl Double Pane Annealed Replacement Double Hung Window (Rough Opening: 35.75-in x 53.75-in)
Picture Windows	0.49	358.57	Wood	702	0.51	AWSCO Octagon Replacement Window (Rough Opening: 24.5-in x 24.5-in)
Glass Block Windows	0.49	587.23	vinyl	1,835	0.32	CrystaLok Wavy pattern Vinyl New Construction Glass Block Window (Rough Opening: 41-in x 48.75-in)

Tickmark

A From data is obtained from Lowe's

Chart to compare the U-values

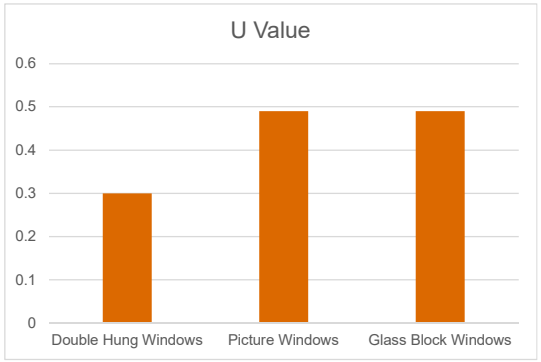
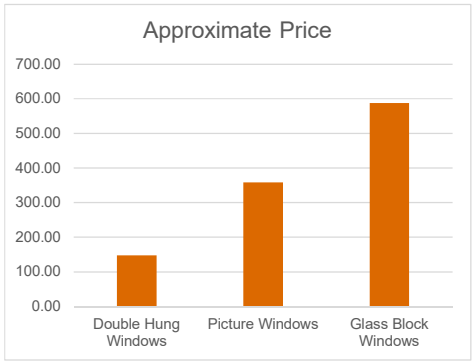
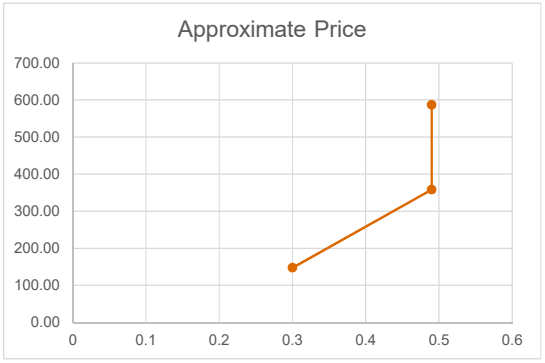
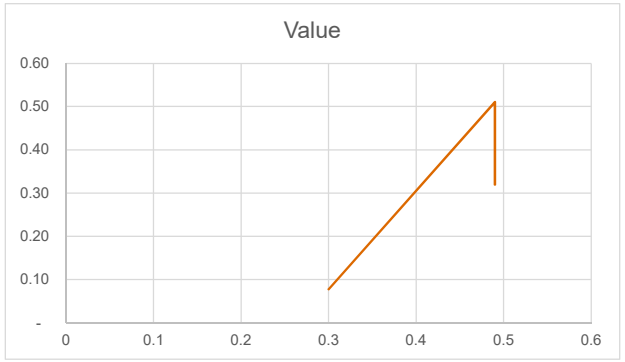


Chart to compare the prices



Scatterplot between the U-Value and the price





Conclusion

Based on the analysis above with three typical windows assembly, there is no relationship between the U-value and price. There are a lot of other factors that will go into the price. For example, the wood frame picture window is a lot more expensive because of its unique frame material of wood which has a higher U-value which is not good for thermal transmittance.

Relationship between center-of-glass U-value to assembly U-value?

Assembly U-value is the “area weighted” average thermal transmittance of all components (i.e. center-of-glass, edge of glass, and frame). Each piece will contribute to the overall assembly u-value hence window area and configuation can significantly affect the overall window assemly u-value. U assemly=((U frame* frame area)+(U edge* edge area)+(U center* center area))/(total area).