

There are a number of factors to consider answering this question. R values measure the insulative properties of building materials and are used to calculate overall insulative properties of homes. More information can be found here.

<https://efficiencymatrix.com/building-material-r-values/>

1. Glass has insulative properties (0.006). Solar panels convert approximately 20% (panel efficiency) from heat to electricity so actually perform better than standard glass panels. The properties of a solar panel are as follows:

Layer	Layer Thickness t, (m)	Material Thermal conductivity k, (W/m <sup>2</sup> K)	Material Thermal resistivity or R value, R, (m <sup>2</sup> K/W)	Panel Thermal resistivity or R value, R, (m <sup>2</sup> K/W)
1. Glass	0.003	1.8	0.555	0.00016
2. ARC	100 x 10 <sup>-9</sup>	32	0.333	33 x 10 <sup>-9</sup> / 0.000
3. PV Cells	225 x 10 <sup>-6</sup>	148	0.007	1.5 x 10 <sup>-6</sup> / 0.000
4. EVA	500 x 10 <sup>-6</sup>	0.35	2.857	0.0014
5. Rear Contact	10 x 10 <sup>-6</sup>	237	0.004	0.04 x 10 <sup>-6</sup> / 0.000
6. Tedlar	0.0001	0.2	5.000	0.005
PV Panel Total	0.0041			0.007

1. Air is also an insulator. Our Roof Integrated panels are 70mm thick and fitted to a roof batten which is a minimum of 25mm thick. These two measures combined create an insulative air gap behind the glass of the panels of 95mm. An air gap of 1.2cm to 10 cm has an R value of 0.176 <https://efficiencymatrix.com/building-material-r-values/>

2. Roof Sarking Foil- The thermal property of sarking foil varies between brands. You should consult manufacturers specifications for each roofing material. Some examples

Brand	R- Value Summer	R -Value Winter
Bradford Thermoseal Roof tile Plus	1.5	0.98
Ametalin Silversark- XHD	1.51	0.93

To calculate the thermal properties of our roof integrated solution

Panel: 0.007 + Air gap 0.176 + Sarking 1.51 = **1.693**

### Conclusion

In reality, when working out total impact you add up the R values, roof material makes very little difference because all have very low R values.

Colorbond: 0

Terracotta tiles: 0.004

Concrete tiles: 0.05

The air gap and sarking (or foil blanket under steel) is what makes the difference.

If you think about the impact to the living space in the house, then the attic space (air) and the ceiling insulation is what makes the difference with R values of around 0.3 to 1.4 for the attic space and 3.5 to 6.0 for the ceiling insulation.