This Guidance is only valid for Class 1 Buildings in Australia

## Step 1: Determine Climate Zone

Use the following link to determine the climate zone of your subject building.

https://www.abcb.gov.au/resources/climate-zone-map

## Step 2: Determine the direction of heat flow ('**Summer/ Down**' heat flow in or '**Winter/ Up**' heat flow out)

| | Heat Flow Direction | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Climate Zone | 1 | 2 | | 3 | 4 | 5 | 6 | 7 | 8 |
| | | altitude less than 300 m | altitude 300 m or more | | | | | | |
| Roof/ Walls | Down | Down | Down and Up | Down and Up | Up | Up | Up | Up | Up |
| Floors | Up | Up | | Up | Down | Down | Down | Down | Down |

## Step 3: Determine the solar absorptance (SA) of building fabric (roof and external walls)

The SA of a surface is the proportion of the total incident solar radiation that is absorbed by the surface material (the remainder is reflected). SA is expressed as a ratio between 0 and 1. A surface (roof or wall) with a lower SA will absorb less heat, compared to a surface with a higher SA, which will help in keeping the surface space and the building cooler. A surface with a lower solar absorptance will reflect more heat than a surface with a higher solar absorptance and will keep the building (e.g., dwelling) cooler on a hot day.

Typically, the SA is related to the colour of the surface as shown in the table below. Where the actual SA is not known, select the appropriate colour category: light, medium or dark.

| **Solar Absorptance (SA)** | **Typical Colour** |
|---|---|
| < 0.475 | Light |
| 0.475 - 0.7 | Medium |
| > 0.7 | Dark |

Manufacturers have been advised to provide a SA value for the colour you choose. For example, the following links provides information about the SA of different COLORBOND® steel Core Colours.

https://steel.com.au/resources/colours

### Surface colour and glare

While a lighter colour surface will have higher heat reflection (or lower SA) than a darker surface, it will not necessarily produce more glare or light reflection. It is possible to get a surface with low SA and low light reflection. Users should investigate these options where glare for neighbours may be a concern.

**Note:** In overall, if you are unsure about the SA of the finishes of the external materials of your building, please refer to the COLORBOND® steel Core Colours and guess the SA based on the colour of external building materials for roof and walls.

## Step 4: Determine the total R-value for the roof, walls and the floor separately

Option 1 (recommended): Follow the instructions on the ICANZ (2016) Insulation Handbook Part 1: Thermal performance, for total R-value calculations. The instructions start from page 10, which consists of 6 steps, including:

- STEP 1 - SELECT YOUR SYSTEM
- STEP 2 - IDENTIFY MATERIAL LAYERS
- STEP 3 - IDENTIFY VARIABLE LAYER
- STEP 4 - CHOOSE INSULATION, VENTIALTION & HEAT FLOW DIRECTION
- STEP 5 - TOTAL UNINSULATED SYSTEM R-VALUE
- STEP 6 - TOTAL INSULATED SYSTEM R-VALUE

Option 2: Follow the instructions in Part J1 Building Fabric of the Guide to Volume One 2019

**Note:** You can use both options one and two simultaneously. For example, you can use option one to calculate the R-value of the "pitched tiled roof with flat ceiling" and option two to calculate the R-value of the 100 mm solid concrete slab-on-ground, etc.

## Step 5: Determine whether your building fabric comply with the requirements

Follow the instruction in NCC 2022 ABCB Housing Provisions – Part 13.2 and check whether your building fabric systems, including roof, walls (internal and external) and floor comply with the requirements.

**Note:** If there are no minimum requirements for any system, you can simply say “NCC 2022 does not provide any minimum requirements for …”.

## References

*Roof Colour and Solar Absorptance*. (2024). New South Wales Government. https://basix.nsw.gov.au/iframe/thermal-help/design-principles2/insulation/roof-solar-absorptance.html