

SUPERPOD[®] STAR RATINGS & SUSTAINABILITY

Superpod[®] has achieved high local energy ratings, but such ratings do not even begin to assess the benefits of a passive house which are literally 'off the scale'.

- Sustainability can mean anything from renewable or recycled materials to solar hot water
- And some people use 'passive solar' design principles too - facing the building north and including some concrete or other thermal mass inside
- Local energy ratings are the way our building codes recognise some of these things
- In Australia a Superpod® house design easily achieved a star rating of 8.5, without really recognising all passivhaus elements.

- Passivhaus principles are the ultimate for sustainable building performance. Why? Because they use building physics for design of the building
- At Superpod[®] we believe sustainability starts with the building envelope
- That's because a well designed building uses less energy to keep you comfortable all year round





HOW IS PASSIVHAUS BETTER?

PASSIVHAUS	CONVENTIONAL BUILDING
\checkmark Building is well sealed like a cooler or thermos flask	🗙 Building is not air tight
✓ Utilises occupants for warmth	ig imes Building does not consider occupants to generate warmth
✓ Controlled air flow	× Building leaks air
✓ Controlled air temperature	× Poorly controlled, perhaps through some exposed thermal mass
 Sun protection on hot days using insulation and predesigned shading 	X Gets hotter in summer
\checkmark Keeps warm in winter without traditional central heating	X Gets colder in winter – needs extensive central heating
✓ Don't need thermal mass	➤ In passive solar designs, need thermal mass facing the sun to work
V Building system physics calculation $2+2=4$	\times No physics calculation $?+?=?$
✓ Building airtight tested	× Building not airtight tested
✓ No fireplace needed	X May need a fireplace for extra heat
\checkmark Specified energy use of envelope as a benchmark	× No benchmark
✓ Auditing system for envelope	× No auditing system
✓ International certificate available	× Not internationally verified

PASSIVE SOLAR IS NOT AN EXACT SCIENCE

A 'passive solar' house is different from a passivhaus. A passive solar house is designed around some rules of thumb. It requires internal concrete or other dense 'thermal mass' and an orientation to the sun, so that in winter the sun can shine on that mass to warm the house.

A passive solar house requires exposed thermal mass to face the sun. If you cover the thermal mass with carpet or timber flooring, it won't work.

Passive solar houses do not tend to model the entire building's performance. It is not an exact science. You hear of passive solar houses that are too cold in winter because there is too much thermal mass, not enough sun, and the building isn't properly insulated. You also hear of passive solar houses that get too hot in winter because there is too much sun on the thermal mass.

THE QUESTION IS, HOW WILL YOU KNOW?

Passivhaus buildings take the whole building system into account by using meticulous building physics calculations. There is a spreadsheet with lots of calculations used by experts to model how the building will perform.

Crucial to the modelling is the building's context. That is, what is the surrounding local climate, and which way does the building face?

All thermal bridges and joints are calculated and measured.

Your passivhaus consultant uses the spreadsheet from the start to make

Part of a passivhaus calculation

sure your building will use a minimal amount of energy from year to year for heating and cooling - and to make sure your indoor temperature is constant as far as possible. All rooms, walls and windows are considered. You don't need thermal mass in temperate climates, because the building will be designed to effectively generate and retain heat without it.

So if you are asking around for a sustainable house, just ask these questions. How does your designer prove that your building will perform a certain way? Where is the spreadsheet they use to calculate the building physics solution? What is the benchmark? The answers will be revealing.



source: www.passipedia.passiv.de







