

# SIPS

## INDUSTRIES

SUSTAINABILITY



## SIPS INDUSTRIES – SUSTAINABILITY

Sustainable Construction and Healthy Living begins with knowledge. At SIPS Industries, we are driven to provide one of the most sustainable building products that will also result in the most comfortable living conditions for the end user, without effecting the living environment. Our product will assist designers to achieve the ultimate goal of Net Carbon, Off-Grid, Passivhaus, and Living Buildings. The products used to manufacture SIPS Industries assemblies are sustainably sourced to limit the carbon emissions of the manufacture process.

*“Surely we have a responsibility to leave for future generations, a planet that is healthy and habitable by all species.”*

– Sir David Attenborough

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### Carbon Emissions

Buildings can be carbon neutral or negative.

As of writing (June 2019), less than 1 in 5 new buildings in Australia are constructed to anything more than the minimum energy requirements that was outlined in the National Construction Code of Australia (NCC) or Building Regulations of 2016.

The new construction code of 2019 has not increased the energy performance requirements of any significance, meaning the next change to the energy performance requirements of new buildings will most likely be in 2022. New buildings between now and 2022 excluding any grace periods, will likely result in 3 Million Tonnes of additional greenhouse gas emissions for housing alone. This also equates to a minimum of A\$1.1 (to 2050) in avoidable household energy bills.

To put the emissions into perspective; in December 2017 the world needed to reduce carbon emissions by 1.3 Trillion Tonnes. By 2022; on top of the current built environments emissions, dirty fuel emissions, mining, and industry et al, the **new housing** industry in Australia will add 1.3 Million tonnes of avoidable CO<sup>2</sup> to the atmosphere.

### What can we do?

Be responsible, even if our government is not.

Choose sustainable building materials. Choose energy efficiency. Choose to build with the future in mind.

Using sustainably sourced building materials, such as timber from managed plantations, will not only reduce the carbon emissions of the building; timber is a carbon sink, it absorbs carbon during its life and when used in buildings, that carbon is locked away and will not be released into the atmosphere. Forests are the planet's lungs and managed plantations ensure that deforestation will not occur.

Don't accept vanilla. The vast majority of builders are offering the bare minimum when it comes to energy efficiency. Ask how many stars a home achieves. If they say 6 (5 for apartments), walk out and don't look back, that is not a sustainable home.

It is our responsibility to leave our environment in a healthy state for the next generations of not just mankind, but the 8 million other species on our planet.

We leave a print on the planet, build right and build tight. Energy efficient responsible buildings will help to reduce our impact on the world around us.







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*“Green buildings are a hallmark of economically sound business decisions, thoughtful environmental decisions, and smart human impact decisions”*

-Rick Fedrizzi

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### Timber – the renewable natural resource

Forests stabilise the earth's climate by storing CO<sup>2</sup> and releasing Oxygen. The demand for wood as a raw building material is steadily increasing as an alternative to high carbon emitting produced fossil materials.

Wood sourced for building needs to be sourced from renewable managed plantations. Due to the increasing demand for wood as a raw building product, hardwoods are no longer an option and some structural softwoods will become difficult to source due to the time it takes to grow. Fast growing woods are easy replenished and are perfect for use in the manufacture of OSB and laminated timber such as CLT.

SIPS structural board is OSB which is sourced from certified renewable managed plantations.

OSB is Oriented Strand Board which is a structural board comprising of oriented layers of a mix of wood strands strategically placed and glue pressed into an engineered wood board. The entire wood log is used and therefore there is no wasted wood. The wood is sourced from parts of the 8.7 million hectares of managed forest plantations in Europe. Australia are in the early stages of planting new managed forests with the intent to service its increasing demand for wood products.

### Chain of Custody (CoC)

All wood boards and timber are sourced from certified sustainable forestry and from Chain of Custody (CoC) certified suppliers.

SIPS Industries can supply CoC certificates, codes and serial numbers for timbers and boards. This ensures the wood is not: sourced from illegal harvesting, originates from regions where civil or fundamental rights are violated, forests with high protection values, genetically manipulated trees, or originates from forests that will be converted into plantations or to non-forestry uses.

PEFC – certificate HCA-CcC-0183

FSC® - certificate HCA-CoC-100017 & HCA-CW-100017

FSC® - cert DNV-CoC-000719, DNV-CW-000719 & FSC-C1117015



## Storing CO<sup>2</sup> – Greenhouses Gas and Climate Change

Mentioned previously, when wood is used as a building material it is dedicated to that building for many years, possibly a hundred or more. One meter cubed of OSB will bind 864kg of CO<sup>2</sup> – almost 1 tonne. In comparison; brick buildings will contribute 907kg of CO<sup>2</sup> per meter cubed, whilst steel emits 1.83 tonnes of CO<sup>2</sup> for every tonne of steel used. The steel industry contributes between 7% and 9% of direct CO<sup>2</sup> emissions from the global use of fossil fuel.

Concrete is the most widely used manmade product in the world and comes second only to water as the most consumed resource on the planet. – Lucy Rodgers, BBC.

Our cities and built environment have been shaped by concrete at an enormous rate of growth since WWII, but it has a massive carbon footprint. Cement, the most important ingredient in concrete, contributes to 8% of the worlds carbon emissions. China is by far the largest emitters of CO<sup>2</sup> followed by the US, concrete would be third if it were a country. Concrete is an important building material; strong, affordable and can be produced almost anywhere. But overreliance on concrete has impacted our climate crisis and the trend needs to be curbed. Concrete production has increased 30 times since 1950, China has used more concrete since 2011 than the US did in the whole of the 20th century. With buildings worldwide expected to double by 2050, at the current percentage of concrete being used, this would represent massive increase of CO<sup>2</sup>. Emissions from concrete production currently need to be reduced by 18% every year to coincide with the required decline of CO<sup>2</sup> emissions by 45% from 2010 levels by 2030, a figure currently looking highly unlikely.

## Storing CO<sup>2</sup> in wood helps to lower the greenhouse gasses in the atmosphere.

SIPS Industries 115mm panel on average uses 0.26m<sup>3</sup> of wood per cube; which equates to 225kg of CO<sup>2</sup> stored in the product per meter cubed.

SIPS Industries Australia are proud to be responsible for the binding of in excess of 770 Tonnes of CO<sup>2</sup> annually.



1 meter cubed of wood stores 825 kg of Greenhouses Gas.

## The Building Sector

This ever-growing sector is surprisingly slow to adapt new methods and usually requires some disruption of supply to push for change and adaptation; change due to necessity more than desire. If there ever was a necessity for change, it is now, and especially with an ever-shrinking timescale to reduce our emissions.

SIPS are not the only substitute product on the market that can assist change and absorb carbon rather than emit it. The industry needs a change and hopefully we can assist in the change by providing a quality and better alternative.

## Insulation.

Wood is a fantastic framing material and needs to be complimented with insulation to ensure the building performs to a high standard of energy efficiency. At SIPS Industries, we use EPS (expanded polystyrene) for several reasons. We have tried, tested or considered every insulating material available and our decision to use EPS for our panels, as has most SIPS manufacturers throughout the world.

Although EPS is a byproduct of fossil materials, 98% of the product is air. This is an excellent insulant that is rigid and will not break down or lose its insulant characteristics over time. As EPS is rigid, the panel becomes an extremely strong building component tested to withstand cyclonic winds and multi-storey loads.

EPS is somewhat controversial among environmental groups, as it is also used for single use packaging and to-go containers. When Eps is used in this fashion it ends up as waste and can find its way into rivers and oceans. This is unfortunate and at SIPS Industries, we do not condone the use of such materials as single use packaging. EPS, when used in building is locked away in the building for many years and gets re-used if the building is demolished. Many of our buildings are the homes of environmentally aware people who realise the sustainable benefits of the overall product.

The EPS used in SIPS Industries panels contains no ozone depleting substances and no carcinogenic substances. ODP=0  
No Hydrofluorocarbons, No hydrochlorofluorocarbon.  
No Hexabromocyclododecane (HBCD)

Our insulation is inert and therefore does not off-gas or release any formaldehyde. The insulation is high performance and can be supplied in various grades to suit an increased insulation value where necessary. Typically, we chose insulation grades suited to the local Australian environment.

Insulating a building with a rigid air-tight material will reduce energy loss far more substantially than non-rigid insulation as there will never be any gaps between the construction and the insulation, thus zero energy loss.

## Healthy Buildings

SIPS External Wall and Roof panels are lined with a breathable membrane lining. This allows moisture to escape and evaporate away from the building. Moisture can build up on the cold external surface of a building due to vapour within the building penetration the structure, a wet construction period, or leaks. If this doesn't expel away from the structure, moisture will build up on the inner face of the external cladding causing mould and 'Sick Building Syndrome'. SIPS Industries are focused on delivering long term solutions to building and ensure the building remain healthy, which in turn affects the occupants. Mouldy homes can cause many human health problems such as CIRS (chronic inflammation of the respiratory system).

SIPS Industries panels are suitable for exposure internally and are tested under the European Regulations for Formaldehyde. OSB is a natural wood product and as such will have very small amounts of natural formaldehydes, so small in fact the board is certified E1

Emission Classes	E1		IOS-MAT 003		Formaldehyde
Test Method	EN 717 (ppm)	Perforator EN 120	ASTE 1333 E (ppm)	Perforator EN 120	JIS A 1460 (mg/l)
OSB	0.1	Max.8	0.09	Max.4	<b>0.3</b>

When we discuss sustainability, the energy performance of a building should be first and foremost. Sustainable building starts with design, then material selection. An energy efficient design will be sustainable as it will consume far less energy than poorly designed buildings.

Material selection will then seek to minimize the negative impacts on the environment along with consideration for renewable energy systems. When considering renewable energy sources for heating and cooling spaces, the energy used in a SIPS building will be so much less that rick or framed buildings that the energy demand will be low. A low energy demand greatly assists the energy source required for heating and cooling of spaces.



## Recycling

SIPS Panels are suitable for recycling as once they are not damaged beyond repair, they may be suitable for re-use to form building components in the future. SIPS Industries recommend designers utilise standard SIPS panel sizes in their designs, this reduces the initial cost of the panels, but also assists in the re-use of the panels in the future.

Unused EPS is recycled by the suppliers. Following manufacture, any EPS that is unusable for production, is accepted back by the EPS suppliers and is recycled in their batching.

OSB when deemed unusable for production, or further production is retrieved for landfill. OSB is an organic material and will biodegrade in anaerobic landfill within 10 years. Tested Loss of 38% cellulose and hemicellulose after 2.5 years – tested with OSB made from hardwood – OSB used by SIPS industries is from softwoods and actual biodegrading of this OSB is expected to occur much sooner.

## End of Life

At SIPS Industries, we are committed to reducing waste and we know the properties of our panel systems. SIPS are committed to reusing panels and will accept undamaged end of life panels for re-use or correct recycling.



## Reducing our Carbon Footprint

Building sustainably is not based on product selection determined by what that product is made from but should be based on what the product choice can achieve as part of a wholistic approach.

SIPS Panels form an almost air-tight structure, tested to 0.25 Air Changes per hour under 50Pa – 2.4 times better than the Passivhaus minimum, and 60 times better than the average Australian home. Airtightness together with high performing insulation will ensure the building is quick to heat or cool, and will maintain the desired temperature reducing energy consumption.

The energy saved on heating and cooling by building with such a product can shave up to 5 years off a 30-year mortgage on energy savings alone.

#### Other SIPS Documentation

Refer to supporting documentation by SIPS Industries for information to coincide with this specification document:

**SIPS PRODUCT INFORMATION** – For further information on the benefits and product usage of SIPS Industries Structural Insulated Panels; download this general information document from our website [www.sipsindustries.com.au](http://www.sipsindustries.com.au).

**INSTALLATION GUIDE** – SIPS Industries Install Guide forms part of the product certification and is to be strictly adhered to. Any install requirements outside the scope of the document is to be referred to SIPS Industries technical team. Receiving and install methods carried out that deviate from this document may void the product warranty.

**ELECTRICAL and PLUMBING GUIDE** – This document will assist electricians, plumbers and designers. SIPS panels come with conduits pre-formed within the panels for electrical wiring, wiring must comply with 'the Australian wiring rules' AS/NZS3000.2:2007. Cable in contact with EPS must be compliant with AS/NZS5000.2:2006, and all cables must be non-migratory sheathed. Generally a purple cable for visual recognition.

#### Certification

The CodeMark Certification Scheme (the Scheme) is a voluntary third-party building product certification scheme that authorises the use of new and innovative products in specified circumstances in order to facilitate compliance with Volumes One and Two of the NCC, also known as the Building Code of Australia or BCA. CodeMark provides confidence and certainty to regulatory authorities and the market through the issue of a Certificate of Conformity, which is one of several options available for meeting the 'evidence of suitability' requirements of the BCA.

SIPS Panels are suitable for use as floors, walls and roofs are fully engineered, engineer certified and CodeMark® certified under the ABCB Codemark® Scheme.

 <b>CODEMARK®</b> Australia CM40361	 <b>CODEMARK®</b> Australia CM40362	 <b>CODEMARK®</b> Australia CM40363
SIPS Wall Panels	SIPS Roof Panels	SIPS Floor Panels



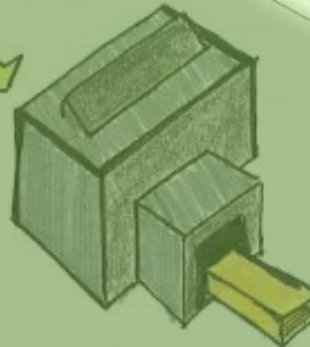
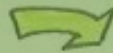
The SIPS Lifecycle



Managed Forestry Plantations



100% of Logged Wood is used

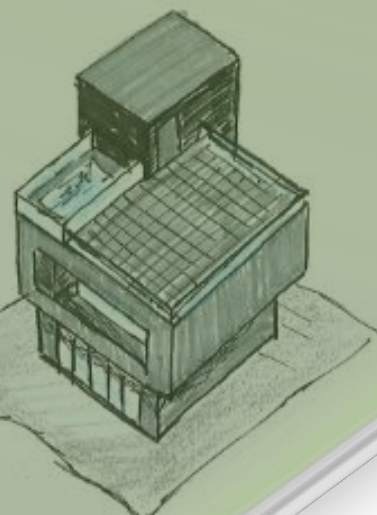


OSB sheets are pressed, treated and cut to size

OSB is shipped from Germany to SIPS in Fremantle, WA



SIPS Panels are produced in our factory, and delivered to site for erecting energy efficient buildings across Australia



End of Life Panels can be Reused or Recycled



## References

- |  |   |                                   |
|--|---|-----------------------------------|
| Climate Change: The massive CO <sup>2</sup> emitter you didn't know about                    | – | <i>Lucy Rodgers, BBC</i>          |
| This changes everything  | – | <i>Naomi Klein, Penguin</i>       |
| Naturally Egger: Sustainable construction and healthy living with Egger wood-based materials | – | <i>Andreas Herzog-Heim, Egger</i> |

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