Metalcraft Solar

INTEGRATED
LIGHTWEIGHT
SUPERIOR WEATHER RESISTANCE

# SOLAFLEX

Integrated Solar solutions for your home

espan® 470 with SolaFlex

# ABOUT LAMINATES

Solar Laminate strips are an innovative product offered by Metalcraft Solar to complement our espan® 470 roof system.

This is an alternate form of integrated Solar technology, which comes in the form of a flexible strip with an adhesive backing that adheres directly to the roof surface.

This is an alternative from of energy generation technology to Photovoltaic (PV) which is most common among conventional Solar modules.Instead Solar Laminates use CIGS (Copper indium gallium selenide). Solar cells made of this material is deposited as a very thin layer on the flexible backing strip which then has a coating of adhesive applied.

Because the material has a high absorption coefficient and strongly absorbs sunlight, a much thinner film is required than of other semiconductor materials.

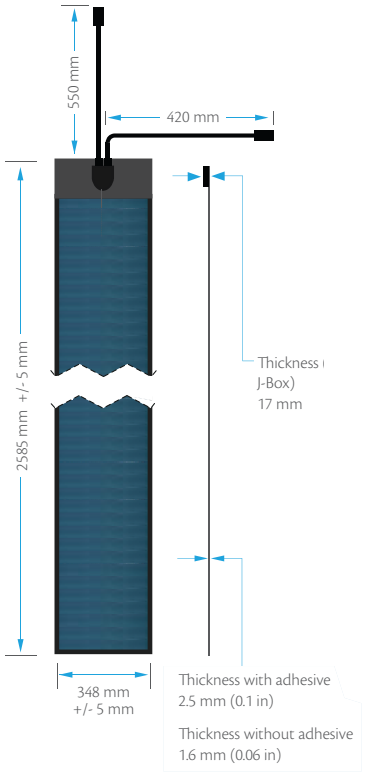
The efficiency of Solar Laminates is between 16-17% (depending on the product), whereas conventional panels are around 18-20%. However, CIGS technology is known to be more effective in flat pitch conditions, and in vertical application such as wall cladding.

# PRODUCTS

We carry the recently released Third Generation of this product range, which includes a 290Watt module, and a 125Watt module. Both options are 348mm in width, however there is variation in the length.It is possible to ‘mix and match’ on roofs that could accommodate both lengths in different areas. There are some limitations to this however, so best to consult with one of our Solar team to discuss options.

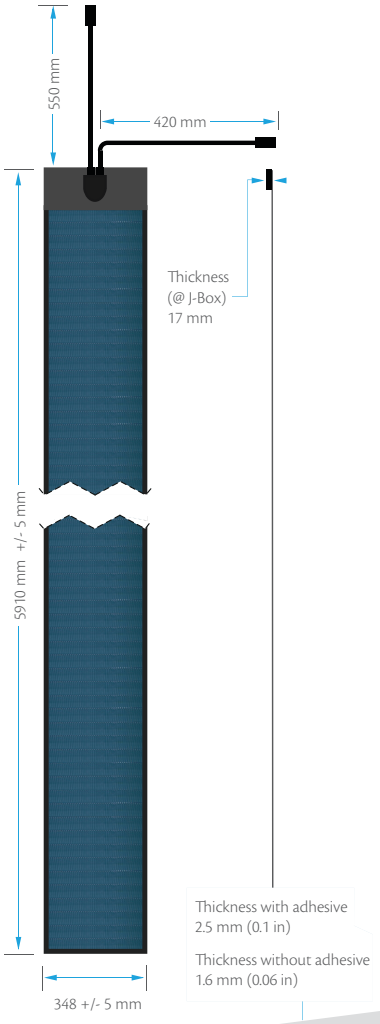
## SOLAFLEX 125W

Offering 125Watts per 2585mm strip. A great solar solution for homes with shorter roof sheet lengths that are becoming increasingly common.



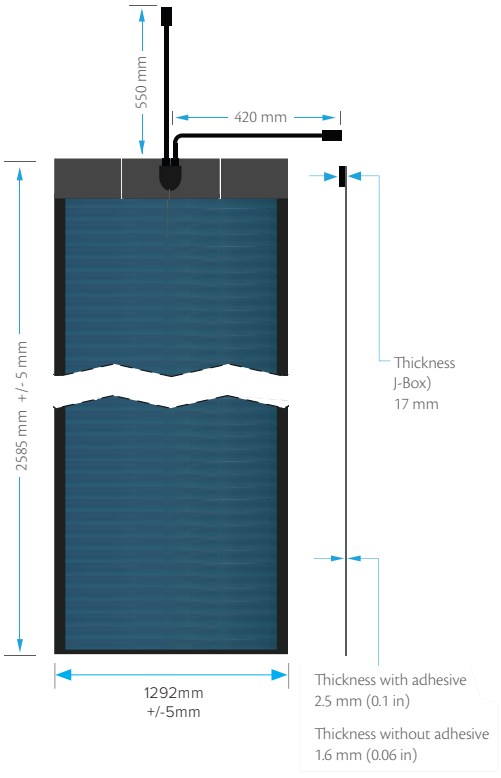

## SOLAFLEX 290W

The 290Watt option is 5,910mm in length, requires 100mm clearance from eave line, so 6000mm roof sheet length is the minimum for this product.



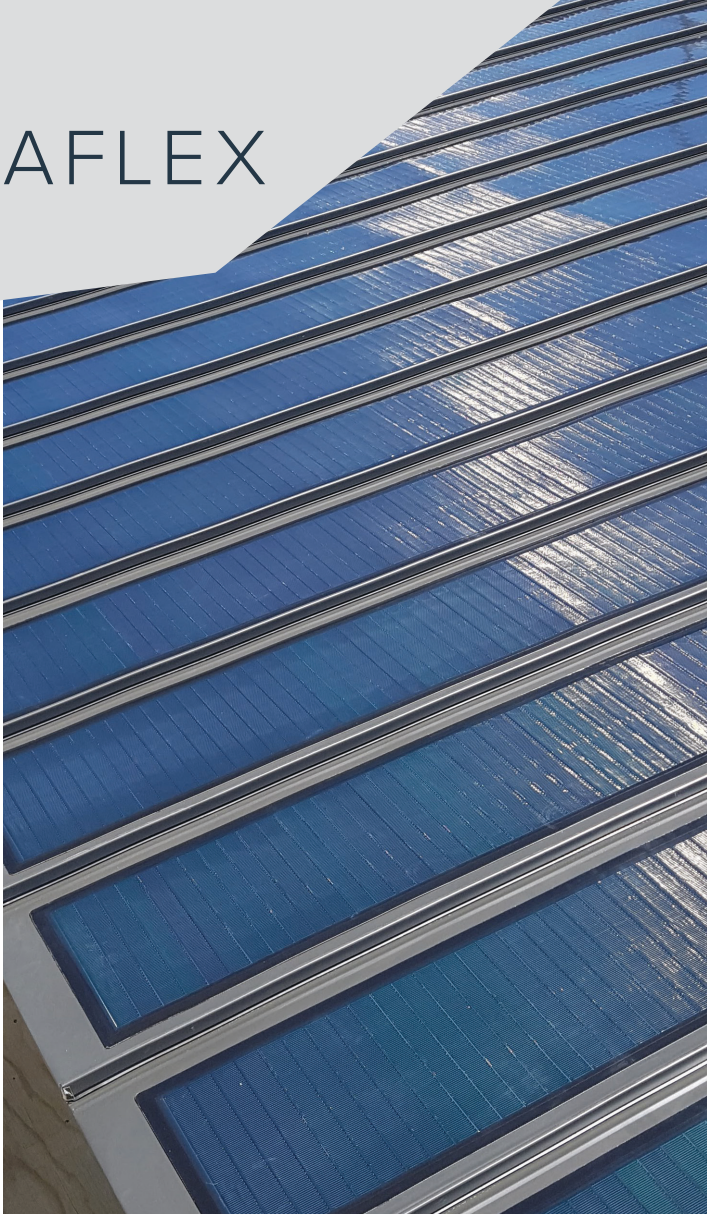

## SOLAFLEX 500W

This product offers 500Watts for commercial applications, 2583mm long x 1292mm wide. This product is typically used on a flat smooth membrane, or adhered to a customised aluminium plate mounted to the roof.




NB: 125W & 290W are stocked by Metalcraft in NZ and not ordered in on a job by job basis, so we can provide a rapid turnaround from quote acceptance to installation. Solaflex 500W is not a stocked product and so incur sa longer lead time for supply.

# SOLAFLEX



## TECHNICAL DATA

### Electrical performance at stc[1]

| | | | SOLAFLEX 125W | SOLAFLEX 290W |
|---|---|---|---|---|
| Nominal Power | $P_{MPP}$ | [W] | 125 | 290 |
| Nominal Efficiency | η | [%] | 16.4% | 16.1% |
| Power Output Tolerance | | [W] | +5/-0 | +10/-0 |
| Maximum Power Voltage | $V_{MPP}$ | [V] | 30.0 | 70.3 |
| Maximum Power Current | $I_{MPP}$ | [A] | 4.16 | 4.13 |
| Open Circuit Voltage | $V_{OC}$ | [V] | 37.4 | 87.9 |
| Short Circuit Current | $I_{SC}$ | [A] | 4.70 | 4.70 |
| Maximum Series Fuse Rating | | [A] | 10 | |
| Maximum System Voltage | IEC/UL | [V] | 1000/1000 | |

[1]Standard Test Conditions (STC): 1000 W/m², 25°C cell temperature, AM 1.5 spectrum

### Physical and mechanical specifications

| | SOLAFLEX 125W | SOLAFLEX 290W |
|---|---|---|
| Length | 2585 mm (101.8 in) | 5910 mm (232.7 in) |
| Width | 348 mm (13.7 in) | 348 mm (13.7 in) |
| Thickness, Maximum at J–Box*, Module | 17 mm (0.7 in), 2.5 mm (0.1 in) | 17 mm (0.7 in) |
| Weight (Module without adhesive) | 1.6 kg (3.6 lb) | 3.6 kg (7.9 lb) |
| Weight (Module with adhesive) | 1.9 kg (4.3 lb) | 4.3 kg (9.5 lb) |
| Weight/Area (Module without adhesive) | 1.8 kg/m² (0.4 lb/ft²) | 1.7 kg/m² (<0.4 lb/ft²) |
| Weight/Area (Module with adhesive) | 2.2 kg/m² (0.5 lb/ft²) | 2.1 kg/m² (0.4 lb/ft²) |
| Junction Box Type | IP68 | IP68 |
| Cable Connections | Amphenol Technology Shenzhen (E346053) | MC4 Compatible |
| Cell Type | Copper Indium Gallium Diselenide (CIGS) | Copper Indium Gallium Diselenide (CIGS) |
| Warranty** | 5 year workmanship; 10/25 year power output | 5 year workmanship; 10/25 year power output |
| Certifications | UL 1703, IEC 61646, IEC 61730, cUL 1703, IEC 62716, Australia CEC. IEC 61701 (Salt Spray) | UL 1703, IEC 61646, IEC 61730 |

*2.5 mm (0.1 in) for the rest of the module with adhesive
*1.6 mm (0.06 in) for the rest of module without adhesive
**Please see full warranty for details

# ADVANTAGES

## COMPATIBILITY

Of the range of Metalcraft Roofing roof profiles, these strips are compatible with Espan 470.
However, they can also be fitted to alternative roof profiles of similar dimensions. For best adhesion, we highly recommend a flat surface, rather than one with swages.
There is some variability in the dimensions of similar profiles from other manufacturers, so bearing in mind the strip width is 394mm, the wider the sheet width, the better to minimise the impact of shading in morning and afternoons.
As well as petal roofing substrates, it is also possible to apply these Strips to a membrane roof surface. They are commonly applied to smooth surfaced membrane roofs overseas, and we have worked with our partners in this roofing segment to develop solutions for compatibility with textured finish membrane roofing also. Remember, CIGS technology is less pitch sensitive so has greater performance properties in flat or low pitch conditions than V panels.

## FEATURES AND BENEFITS

The height of the solar cell portion of a strip is only 2.5mm (junction box is 17mm but concealed), and is adhered directly to the pan of the roof sheet, and is therefore one of the few truly Building Integrated Photovoltaic (BIPV) solutions available in the NZ market today. However, it also offers significant advantages in terms of its weight saving, wind resistance, and maintenance properties.

**AESTHETIC BENEFITS:** this technology offers significant as the array becomes virtually invisible on the roof in contrast to conventional solar modules that are mounted on a rail system atop the highest point of the roof profile. On a dark coloured roof, they are usually very hard to spot from the ground at all because the vertical ribs of espan conceal them from a lateral point of view; yet there is sufficient clearance from the ribs to minimise the risk of shade affecting output. On a low pitch roof, they are usually invisible from the ground, and even on a steeper pitch roof they can be hard to notice when used on a dark coloured roof.
The installation system also conceals all cabling beneath the ridge or head barge flashings, so there is no cabling visible which complements the integrated aspect of the product.
Furthermore, this is paired with espan470 which is fast becoming Metalcraft's most desirable roof option among discerning architects and developers looking to add a design difference with a defined look. The outcome is a stunning roof with the added advantage of an integrated renewable energy source that does not compromise, but rather complements, the overall aesthetics of the project.

## OTHER ADVANTAGES

**WEIGHT SAVING:** Another significant advantage of Solar Laminate strips is that they are significantly lighter than conventional Solar panel options (2.09kg/m2 vs. 11.36kg/m2). This means any new or existing roof structure can easily handle the weight of even a significant array size. This can be particularly relevant when retro fitting to commercial premises, that in the case of conventional panels may struggle to accommodate the far greater weight that an equivalent sized array may add to the building. Int the case of older buildings additional costs may be incurred in reinforcing necessary to bear the weight of conventional Solar panels.

**WEATHER RESISTANCE:** because the strips are completely flush with the roof surface, they offer superior wind resistance properties. Conventional Solar panels are bracket mounted above the roof and so allow wind to get underneath and exert upwards pressure on the underside of the panels, which are over 1.6m long and 1.6m2 each.
As the strips do not require the multiple penetrations necessary for the conventional panel mounting method, this means there is no risk of water ingress associated with the solar element of the roof when using Laminates.
Furthermore, all related cabling is concealed and protected by being run under the ridge or head barge flashings.
The DC cable entry point to the structure is also under the flashings, and does not rely on a boot seal flashing and silicone, so there is literally no penetration required in the roof which is typical of conventional panel installation. This weather protection extends to the junction box on each strip which is also protected from water and UV exposure by the flashings.

**MAINTENANCE:** The use of Laminate strips also eliminates any complications arising from validating roofing material warranty cover, which requires 'unwashed areas' to be cleaned regularly. Access to do so with conventional Solar panels can be tricky at best. Because there are no metal parts to the Laminate strip system, in terms of mounting hardware and the frames of panels that can accumulate debris, there is far less risk of corrosion occurring over time. This means they are advantageous in areas of high salt exposure. Cleaning Laminate strips simply involves a wash with fresh water and a soft brush periodically.

**LESS PITCH SENSITIVE:** Although Laminate strips are slightly less efficient than Solar panels in most cases, the alternative CIGS technology employed by Solar Laminates is less sensitive to variations in pitch. Therefore, they are in fact comparatively more productive in low pitch conditions. Equally they perform better in steep pitch conditions and have been commonly used in wall cladding application overseas, which expands the scope for creative applications for designers.

## WARRANTY

This product is supported by Metalcraft's standard 5-year workmanship warranty, and also a 10/25-year output warranty which means 90% output after 10 years and 80% output for the following 15 years.
PV Laminates can be fitted to both COLORSTEEL ENDURA or MAXX paint grade coating systems without compromising the NZ Steel material warranty
NB:
The strips cannot be modified/shortened, and cannot be draped over a ridge.
They are incompatible with Micro inverters.

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Sustainable Energy Association New Zealand

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