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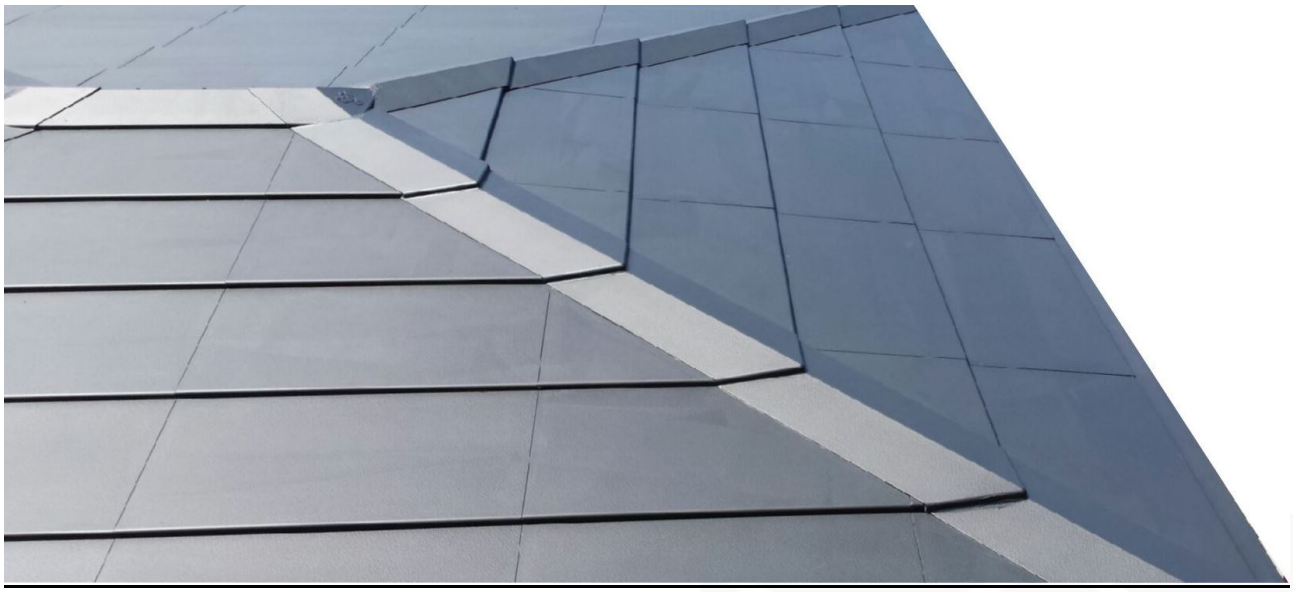
TRACTILE ECLIPSE

ROOF FEATURES

The Tractile product is extremely strong, does not corrode, dent, break (unlike concrete, metal and colorbond) and is interlocked with the roof battens. It scores very well on strengths and environmental specifications. Tractile roof is made from composite materials. Composites are widely used in a number of industries due to their superior performance attributes. The special Tractile formulation material provides the following properties: light weight, high strength, high impact resistance, fire retardant, non-toxic, non-electrically conducting, resistant to a wide range of chemicals.



Point loading	250 kilogram	loaded weight on single Eclipse tile between battens.
Wind speed	300 kilometre per hour	wind speeds for Eclipse roof with Eclipse interlocking battens. Cyclone category 5 has 280 km/hr wind speeds.
Impact resistance	100 Joules	impacts. A 100 Joules impact is equal to being hit with a 68 millimetre hailstones (a tennis ball has diameter of 67mm), or hitting the tile with a 1kilogram hammer at 14meter per second (normal speed for a 1 kg hammer to hit objects is 8 to 12 m/s)

Corrosion	Not possible	because Tractile roofs are made from a non-corrosive composite materials consisting of fibreglass and resins. This material cannot corrode or oxidate.
Interlocked	90% of tile width is locked to batten	this unique interlocking mounting system ensures strong roof fixture and keeps roof penetrations to an absolute minimum.
Insulation	R-value of 0.05	the Eclipse product has a built-in R-value of 0.05. This is approximately equal to 2 to 4 millimetre polyester or glass wool batt. The R-value for colorbond is 0 and a for 10 millimetre concrete tile between 0.006 and 0.008 (seven times less than Eclipse).
Drink water	Safe	The Tractile Eclipse material is non-toxic and in combination with a drink water safe paint, rain water can be safely collected.
Cost Of Ownership	Low	Maintenance free, non-corrosive, does not break or dent, 30+ year durable roof, 25year / 80% solar PV performance warranty
Sustainability	High	Tractile significantly outperforms concrete tiles and colorbond in terms of embodied energy: o in MJ, Tractile is 8 times more sustainable o in kg of CO2, Tractile is 4.5 times more sustainable
Bushfire Alarm Level	BAL-40 TO BE CONFIRMED	After direct flame zone (BAL-FZ) rating, the BAL-40 is the next highest assessed level. BAL-40 for Tractile Eclipse means no embers can penetrate the roof and the roof can withstand heat radiance of 40kW per square meter.

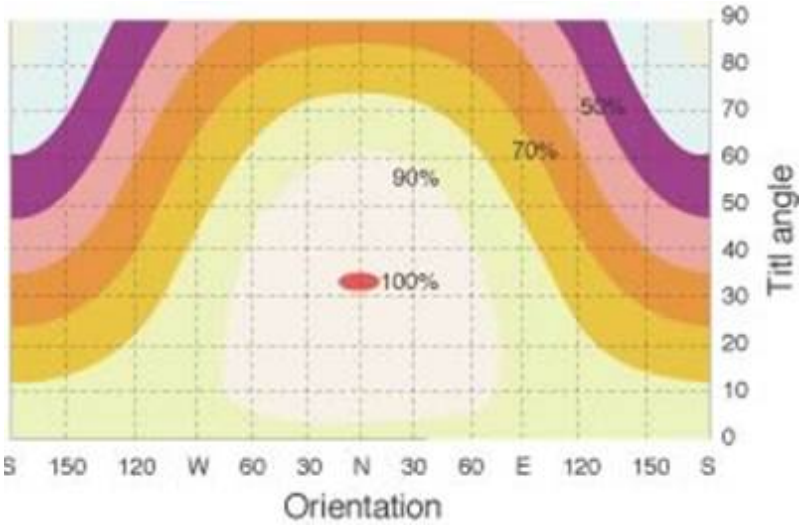
PHOTOVOLTAIC PERFORMANCE

The PV cells used to make the Eclipse Solar tiles are equal to conventional solar PV cells and have the same efficiency under Standard Test Conditions as conventional PV cells (120Wp to 160Wp per square meter).

The Clean Energy Council (Consumer Guide For PV, v21, 19/12/1012) has estimated per capital city in Australia the average daily solar performance. These are averages and based on a 15 to 30 degree pitch with due North orientation. The table below shows some of these daily averages. Please note that solar performance varies over the seasons.

	Per kWp	3 kWp system	5 kWp system
Adelaide, Brisbane, Cairns	4.2 kWh	12.6 kWh	21.0 kWh
Darwin, Perth	4.4 kWh	13.2 kWh	22.0 kWh
Melbourne	3.6 kWh	10.8 kWh	18.0 kWh
Sydney	3.9 kWh	11.7 kWh	19.5 kWh

The best average fixed pitch over a year for solar PV is latitude -/- 10 degrees. For example Sydney's latitude is 34 degrees, the best pitch for a fixed mounted solar in Sydney is 24 degrees. The adjacent graph (http://www.yourhome.gov.au) shows for latitude of 35 degrees the solar PV efficiency under different combinations of pitch and orientation (North, East, West, South) in April and October. It shows that for a due North installed solar PV system, a minimum efficiency of 90% can be expected if the pitch remains between10 degrees and 50 degrees.



The water channels under the Eclipse Solar tile allow the PV cells to be cooled. Test results show that setting the flow of the pump to maintain a maximum temperature of 35 ° C, results in an increased performance of 4% to 8% of Tractile Eclipse vs. conventional solar panels. The table below provides an estimation of the expected efficiencies using Eclipse Solar versus conventional solar PV.

		PV capacity:			
		2kWp	**3kWp**	**4kWp**	**5kWp**
HW outlet	20° C	4%	7%	10%	14%
temperature:	25° C	3%	6%	9%	12%
	30° C	2%	5%	8%	11%
	35° C	1%	4%	7%	10%
	40° C	0%	2%	5%	8%
	45° C	-2%	0%	2%	4%

The actual impact of cooling the PV cells is influenced by inlet temperature and configuration of connected tiles, i.e. in parallel, series, rows or columns.

The table below presents the estimated yearly total performance of an Eclipse Solar roof excluding PV cooling efficiencies in Adelaide, Brisbane and Cairns.

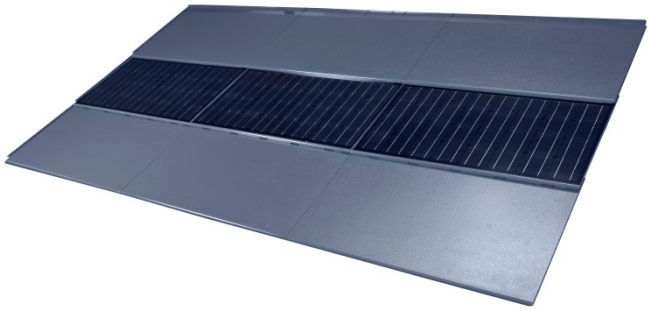
Tractile Eclipse capacity in kWp	**Eclipse roof area**	**# Eclipse tiles**	**Yearly PV output in kWh**	**Yearly HW output in kWh**	**Total kWh/year**
1	7.7	14	1533	477	2010
2	15.4	27	3066	920	3986
3	23.1	40	4599	1363	5962
4	30.8	53	6132	1806	7938
5	38.5	66	7665	2248	9913
10	76.9	131	15330	4463	19793

SOLAR HOT WATER

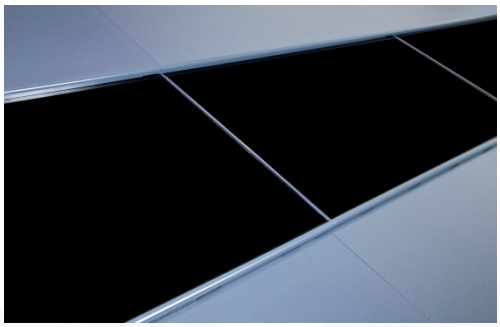
The performance of a solar hot water system is dependent on:

a. ambient temperature
b. wind speed
c. solar irradiance
d. hot water consumption

Tractile Eclipse generates solar heated hot water from:



1) Eclipse Solar tiles. An optimum needs to be found between solar power output and hot water output. The maximum solar power output is achieved by setting a high flow rate through the tiles, resulting in relative colder water. Hotter water is generated by reducing the flow rate, allowing for more time to heat the water. However, this higher temperature reduces the solar power output. As a general rule for most residential use Tractile recommends to set the flow rate to achieve a maximum of 35 ° C. With an inlet temperature of 15 ° C, the estimated average daily volume of 30 ° - 35 ° C pre-heated water per Eclipse Solar tile is 3.5 to 5 litres.



2) Eclipse Thermo tiles. These tiles are designed to maximise the solar heated hot water output. Under the right conditions Thermo tiles can generate hot water with a temperature of 55 ° to 75 ° C. With an inlet temperature of 20 ° C, the estimated average daily volume of 60 ° C heated water per Eclipse Solar tile is 3.5 to 5 litres.

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