SUNGRID™
INNOVATIVE ENERGY SOLUTIONS

The Sungrid Difference

Why quality matters

About Sungrid

Sungrid is an Australian solar energy company that distributes high quality solar modules to customers around Australia, New Zealand and the UK. Only the best quality components are used in the finished Sungrid branded product which means we are able to provide peace of mind with our industry-leading warranties.

Through our extensive international experience and knowledge of the renewable energy industry, Sungrid is constantly working with manufacturers and materials suppliers to bring to market solar modules that deliver a great value proposition for our customers.

Our global business is also growing with the help of a talented team of professionals; we are passionate about delivering innovative energy solutions that make a sustainable difference to the world.

We regard quality control as one of the most important issues in the solar energy industry today. When choosing solar as a long term renewable energy source, consumers need to be confident that what they are buying is safe and is manufactured in accordance with its product certification and will deliver on its promise. This brochure has been created to help explain Sungrid's philosophy on product and manufacturing excellence and to show why quality really does matter.

Why quality matters

Choosing solar energy is a real investment, and within a few years (or less, with the right brand of solar module) that investment will generate a positive financial return in the form of reduced power costs.

When choosing a long term solar product, consumers need to have confidence that what they are buying is safe and will do what it's supposed to do, and more.

Not all solar modules are made equal

Some brands of solar modules use inferior components and without the quality control processes and systems that guarantee the authenticity of the finished product. Sometimes a finished product has been certified but a manufacturer then substitutes cheaper (uncertified) components to reduce the overall cost of production. Unfortunately, it's the end user that suffers; modules that they assume will last for 20 years or more can fail after two or three years.

Have confidence in our product

The third party manufacturing facilities that Sungrid utilises maintain internationally-accredited quality assurance processes. This provides us, and our customers, with a high level of confidence in the quality of our products and the third party facilities in which they are made.

Our products are supported by our warranties. The length of the module warranty is a direct reflection of the confidence a producer has in its own product. Sungrid provides technical support to its manufacturers and assesses their component supplies, manufacturing processes and quality control programmes to ensure the highest quality product.

The Sungrid difference

Quality control, product performance and operational integrity underpin everything we do. These three values differentiate Sungrid branded modules in the marketplace.

Quality control

Ensures that the consumer gets the product that is specified

At Sungrid we employ a rigorous quality control system in the identification and selection of our components, the manufacturing of our modules and in the final Sungrid product. Sungrid's quality control processes are designed to ensure that a Sungrid module is built to the exact bill of materials, as defined by the product certificates.

Our Quality Assurance System

Quality Control → **Operational Integrity** → **Product Performance**

More than 100 specific assessment points across the entire production and supply chain

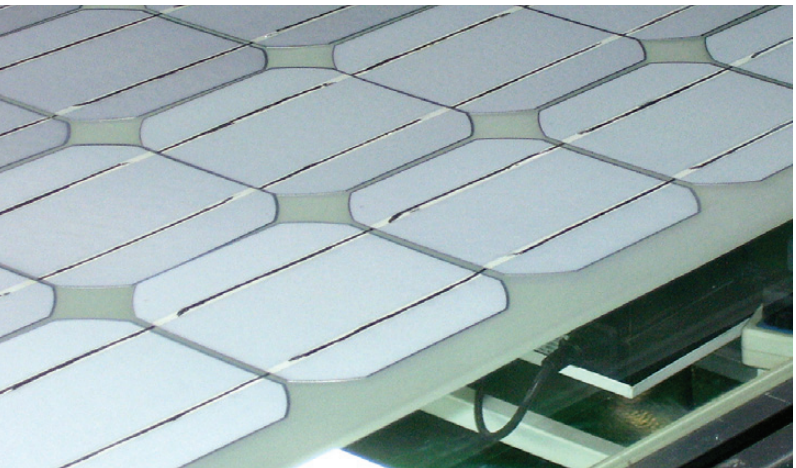
Sourcing	Manufacturing Facilities	Technical Support Services
Only the best components sourced from leading global brands are used in Sungrid branded modules.	We commission regular inspections of third party facilities by independent testing laboratory VDE to check the integrity of the calibration and storage of test equipment and reference modules. Batch testing is also witnessed by VDE assessors to check the repeatability and integrity of our testing process.	Maintaining a technical support team gives Sungrid a distinct advantage in dealing with suppliers of modules and other components of solar PV systems. The technical resources of Sungrid provide the capability to evaluate new technological advances, different brands and equipment and evaluation and management of warranty issues.

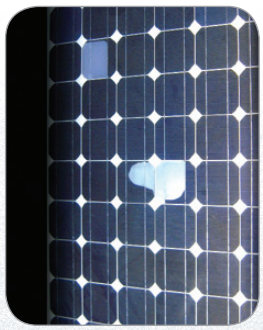
Independent assessment of the manufacturing facilities used by Sungrid

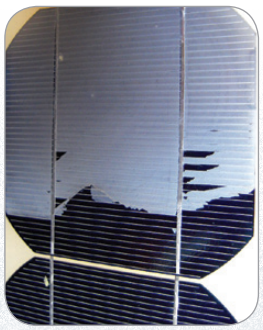
The rigorous quality assurance system implemented at all of Sungrid's nominated third party manufacturing facilities is supported by regular independent assessments and inspections.

These facilities are certified to ISO9001, an internationally recognized quality assurance system requiring a facility to maintain a specific standard of systems and processes.

Our solar modules are certified by VDE, TUV or other international testing laboratories. They are tested in accordance with their stringent standards for robustness and electrical safety to minimise safety risk. The certificate is only valid for modules made with the same bill of materials as those that underwent the tests.







What to watch out for

Some modules have less expensive and inferior materials substituted into their production process after they achieve certification. This can seriously compromise the quality and longevity of the product.

Here is an example of some modules (above) that were sold into Australia under a valid certificate and were approved to be sold in Australia. The encapsulation material had been substituted with a less robust material than the one on the original certified model, with obvious catastrophic results.

These modules were in operation for less than two years. Adhering to the bill of materials does not guarantee that failures will never happen in the field, but it greatly reduces the risk because of the testing and certification process.

Raising the bar on solar module manufacturing standards

The quality control systems we use are overlaid across the entire production and supply chain to ensure products are made to the exact specifications and relevant certifications that we demand.

This inspection process includes more than 100 specific assessment points, covering everything from storage of raw materials to soldering iron temperatures.

Flash testing on all Sungrid modules

Sungrid also conducts flash testing on Sungrid branded modules for power output and performance. This grades the modules into the correct power classes, ensures the +5%, -0% power tolerance specification is followed and provides the real power data of each module to the installer, enabling them to better match modules within an array.

Samples of Sungrid products also undergo the following additional quality control tests:

- Electro luminescence (EL) test – to check for micro-cracks and other cell defects not detected by visual inspection.
- Electrical safety 'Hipot' test – an insulation safety test that verifies the electrical insulation between the frame and the active parts of the module.
- Wet leakage current test – to ensure that there is no electrical current leakage during wet weather.
- Gel content test – to ensure the encapsulant cross-linkage is acceptable after the lamination process to reduce chances of de-lamination.

Product performance

Sungrid solar modules consistently over-deliver on performance

We have set our manufacturing quality and power tolerance standards above international standards to produce high quality, high efficiency solar modules that deliver a great value proposition to the end user.

What does this mean?

Over time, a Sungrid solar module will consistently produce more electricity than modules with the same rating. This means the end user could be saving money over time, and even make money (depending on their electricity usage and the value of their local 'feed in tariff').

A quick comparison of the market will show that we provide industry leading warranties that underpin the performance, power output and parts and product workmanship of our modules:

- Power tolerance warranty of + 5%, - 0% means that all Sungrid modules meet or exceed their rated power output by up to 5% and - 0% (compared to typical industry standards of +3%, - 3%).

  This means that every Sungrid module will produce at least its rated nameplate power. So for example, when a customer buys 190W they get 190W. In fact, recent analysis of the power output of a Sungrid module shows that the average power of the SG-190M5 product is actually 193.8W. That means each module delivers on average 2% (3.8 W) more power than it is rated for. That's an extra 20W per kilowatt installed.

  The test conditions are STC. STC is defined as: Irradiance 1000W/m², Air mass 1.5, Cell temperature 25°C. The 193.8W is the average measured performance under STC of over 12,700 modules.

- Performance warranty of 90% power output after 12 years and 85% power output after 25 years (exceeding the industry standard of 90% after 10 years and 80% after 25 years).

  So when other companies say they have a 25 year performance warranty on their product, it doesn't automatically imply they have the best performance. Always check the warranty details to find out what is under warranty for 25 years: 85%, like Sungrid, or only 80% like many others.

- Parts and workmanship product warranty of 10 years (compared to the average in the industry of five, two or even one year).

Performing well in the field

The Desert Knowledge Australia Solar Centre (DKASC) is a world-renowned testing site and demonstration facility for commercialised solar technologies. It operates in the arid solar conditions of Alice Springs, Central Australia.

In March 2010 we installed two 5kW PV arrays of Sungrid modules at DKASC, alongside other well-known solar module brands.

Ongoing results for the Sungrid modules (at February 2011) are very positive and show that both our poly and monocrystalline modules are performing well.

Our commitment to high quality components and quality control excellence results in more energy production from the module which in turn delivers better value for money for the end user.

DKASC data can be found at www.dkasolarcentre.com.au

NOTE: Desert Knowledge Australia, the Australian Government, the Northern Territory Government and the project managers, CAT Projects do not endorse, and accept no legal liability whatsoever arising from or connected to, the outcomes and conclusions associated with the use of data from the Desert Knowledge Australia Solar Centre.

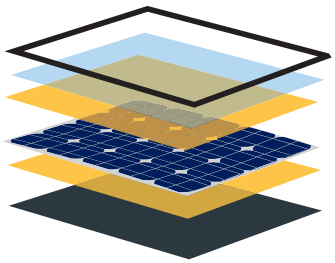
Operational integrity

Peace of mind that Sungrid is delivering a world class product that will outlast the competition

The integrity of Sungrid is evident in everything we do: from sourcing world class products and employing quality controls to safeguard the future effectiveness and safety of the finished product to operating a successful business around the world.

In order to truly understand the layers of integrity that sit within our operation, it is helpful to look at the production process that creates the finished product which is made, literally, from layers of components:

- Aluminium frame
- Solar glass
- Encapsulant
- Cells
- Encapsulant
- Backsheet
- Junction box



Solar modules sit on rooftops for 25 years or more and take quite a beating from the natural elements. Using the best components available in the market from international suppliers allows Sungrid to offer industry leading warranty terms, giving consumers the confidence that the modules will perform over the long term.

The aluminium frame

A deeper more robust aluminium frame protects the modules

One important feature that is often not given much attention is the depth of the aluminium frame that supports the module. The deeper frame on Sungrid modules (50mm vs 35mm on most other module brands) ensures that the modules are more rigid and less susceptible to twisting and distortion during the packaging, shipping, and installation stages.

Solar cells are fragile and can develop micro-cracks in the crystalline structure that are undetectable to the naked eye. Module samples are checked for micro-cracks at the factory as part of the Sungrid quality assurance process, but can still develop at later stages during transportation and installation. Micro-cracks can reduce performance over the long term. Having a deeper, more robust frame helps protect Sungrid modules from the potential to develop these micro-cracks when handled.

The cells, solar glass, encapsulant and backsheet

Sungrid uses the highest quality components from leading international suppliers.
The glass, encapsulation material, and backsheet are critical components that determine the longevity and robustness of the product. They seal and protect the solar cells from the elements as well as provide electrical insulation.

Sungrid modules are assembled from the highest quality components sourced from leading international suppliers. But it is the solar cells used in our modules that are the critical defining benefit when compared to other module brands.

The cells used in a Sungrid module.
Sungrid chooses carefully the manufacturers of the cells for the Sungrid range of modules. Important criteria are the size of the company and its reputation as well as the technical aspect of the cells. All companies supplying cells to the Sungrid line are multinational companies and are significant players in the PV cell manufacturing industry. They are also module manufacturers so understand the application of the cells into the module. On the technical side the cell qualities that are examined include efficiency, temperature coefficient, degradation, and technology stability. These factors give the confidence for Sungrid to supply a generous performance warranty.

Sungrid's cells are utilized to their optimum potential.
The performance of an entire solar module will be reduced if one cell within the module has a lower performance than the other cells. To avoid this happening, we ensure improved module performance by narrowing down the cell performance differential within a module to 0.2%. This means that cells in a Sungrid module are utilized to their optimal potential and are not being 'held down' by lower performing cells within the module.

High shunt resistance.
The cells in a Sungrid module have high shunt resistance (and as a result, a low reverse current) to ensure maximum power in low light conditions, reduced hot spot risk, and increased energy yield.

Some other advantages of the cells in a Sungrid module include:
- Visual quality from sorting cells into colour classes and more than 25 visual quality criteria.
- Low temperature coefficients to improve performance in high temperatures.

Ten things that make Sungrid different:

1. Sungrid customers get more power than they bargain for with a Sungrid solar module.
Our industry leading warranties on power tolerance (+5% -0%), performance (85% after 25 years) and product (10 year parts and workmanship)) mean that customers get a greater return on their initial investment in solar.

2. Our modules are performing well in the field.
Ongoing data from the Desert Knowledge Australia Solar Centre shows that both our poly and monocrystalline modules are performing well. Our commitment to high quality components and quality control excellence results in more energy production which in turn delivers better value for money for the end user.

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3. Only the best components are used in the Sungrid finished product.
We only use components sourced from leading international suppliers. This allows the Sungrid modules to be underpinned by industry leading warranty terms, giving consumers the confidence that the module will continue to perform over the long term.

4. Our quality assurance system includes more than 100 specific assessment points.
This is incorporated across the entire production and supply chain to ensure that products are made to the exact specifications and relevant certifications demanded by Sungrid.

5.Sungrid maintain a quality assurance system which includes assessments that are supported by independent inspections, including those of the international testing laboratory, VDE.
This includes the commissioning of factory inspections by international testing laboratory, VDE to check the integrity of the calibration and storage of test equipment and reference modules. All of Sungrid's third party manufacturing facilities are certified as ISO9001 compliant. In addition to facility inspections, a random sample of Sungrid modules are re-tested and witnessed by the VDE assessor to check the repeatability and integrity of our testing.

6. Sungrid modules are built to the exact, certified bill of materials.
Sungrid does not substitute cheap components for the original certified bill of materials, nor do we sacrifice quality at any stage of the production process.

7. The solar cells used in Sungrid modules are amongst the best quality available on the market.
This is the critical defining benefit of Sungrid modules compared to other brands of solar modules. Our suppliers are leading companies in the silicon and semiconductor manufacturing industries. Their quality assurance and innovative processes ensure that the solar cells utilized in Sungrid's modules will continue to perform over the long term.

8. Sungrid modules have a deeper frame (50mm vs 35mm on most other module brands).
This ensures that Sungrid modules are more rigid and are less susceptible to twisting and distortion during the packaging, shipping, and installation stages. These dimensions also make our modules more robust.

9. We minimise safety risk.
Building modules to IEC standards means the modules tested by the laboratories have passed performance and safety testing standards. Through the use of quality control systems ensuring that the modules you get are the same as the modules tested, you can be assured that what you have will meet the same safety testing standards.

10. Technical support services.
Sungrid's technical support team is based in Fremantle, WA and is available to be deployed across Australia to assist our customers. Sungrid's technical team regularly visits national and international conferences and expos to keep abreast of technology and industry developments. The team also participates in the development of Australian Standards for PV and related technologies and has insights into the concerns and needs for efficient and safe deployment of the technology.

Maintaining a technical support team gives Sungrid a distinct advantage in dealing with suppliers of modules and other components of solar PV systems. The technical resources of Sungrid provide the capability to evaluate new technological advances, different brands and equipment and evaluation and management of warranty issues.

We offer phone support for clients during business hours (8am to 5pm Monday to Friday) and after hours support can be accessed through local sales managers as well as via a dedicated email address. Sungrid can provide product and technology training on request.

Suntelligence

In addition to our premium product range, we also produce an industry standard solar module product called Suntelligence.

The Suntelligence product has been created to compete directly with other 'industry standard' products on the market. It is manufactured using industry standard components and is backed by industry standard warranties, but it is still subjected to the Sungrid philosophies of product quality and manufacturing excellence.

Suntelligence: an industry standard product with industry standard warranties but quality controlled by Sungrid and available at an affordable price.

The main differences between the Sungrid and Suntelligence products are captured in the table below. They relate to the component parts and the warranties that are offered for each range.

	SUNGRID	SUNTELLIGENCE	Industry standard
Product Warranty	10 Years	5 Years	5, 2 or 1 year
Performance Warranty	90% 12 Years, 85% 25 Years	90% 10 Years, 80% 25 Years	90% 10 years, 80% 25 years
Power Tolerance	+5%, -0%	±3%	±3% to ±5%
Frame	50mm	35mm	35mm
Cells	Jetion, Motech and Delsolar	Other	Other

In pursuit of excellence

At Sungrid we have steadfastly driven quality control measures to deliver a level of quality assurance that is challenging the prevailing industry practice. Because of this commitment to quality, Sungrid is able to offer world class warranties on performance, power output and product parts and workmanship.

Continuous improvement and a commitment to innovation mean that Sungrid will continue to push the boundaries in its development of innovative solar energy solutions for many years to come.

SUNGRID™
INNOVATIVE ENERGY SOLUTIONS

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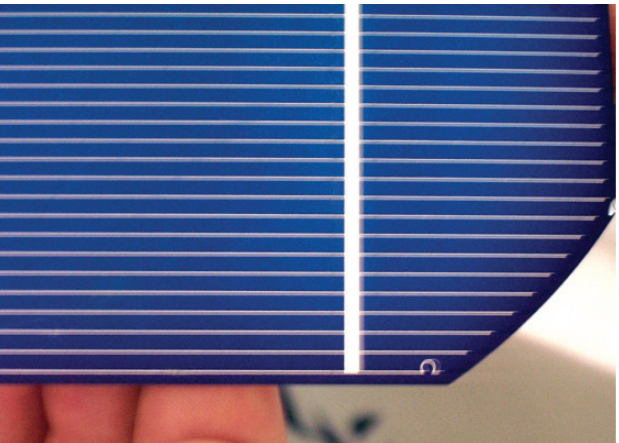
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