

# SolMax – Solar Selective Surface Foil

**SolMax** is an ultra-thin solar selective surface nickel foil designed for the construction of solar thermal collectors. The surface has been engineered to optimise the properties required for enhanced solar thermal energy collection. The morphology of the selective surface and the nickel foil are inherently stable and provide long-term performance and reliability.

## APPLICATIONS of SolMax

- Flat plate solar collectors; hot water and air type.
- Vacuum tube type collectors.
- Passive heating systems.
- A 'Black' body requiring low infra-red emittance.

## BENEFITS of SolMax

- Low set up cost; no specialized coating machinery is required.
- Easily applied by hand.
- No large processing machines so releases factory space.
- Provides an easily repeatable high quality finish without messy chemicals.
- Will operate to high temperatures.
- Optical properties remain stable in extreme conditions.
- Silicone based adhesive has excellent properties; good adhesion, easy peel backing, high temperature range and resistant to a range of solvents.
- SolMax is usually supplied in roll form and arrives in a strong packaging system that is fully recyclable and compact for easy storage.

## PROPERTIES of SolMax

High absorptivity of solar thermal energy

$\alpha$  - 95>99% Typical 96%

Low emittance of infra-red radiation

$\varepsilon$  - 4>10% Typical 7%

Coefficient of thermal expansion  $13.4 \times 10^{-6}$  C

## ADHESIVE PROPERTIES

The adhesive is a pressure sensitive silicone based adhesive with excellent mechanical properties. The adhesive will withstand constant temperatures of 180 C and resist attack from a range of solvents. The adhesive has an easy and smooth peeling polyester release film, which greatly reduces production time and eases handling. The adhesive will form high strength bonds to a variety of surfaces including metals, glass, plastics and ceramics.

**SolMax** is exclusively manufactured by: -

### Energy International Systems Ltd

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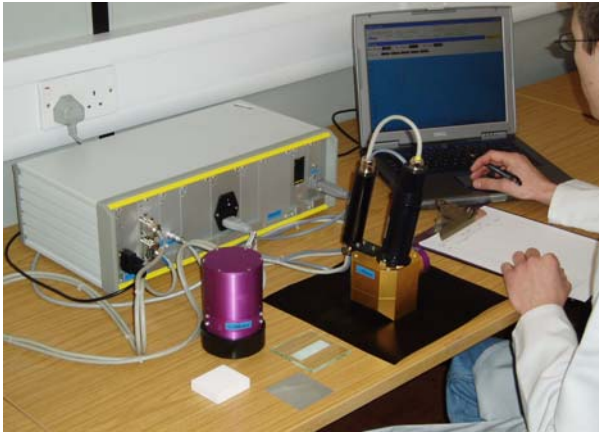


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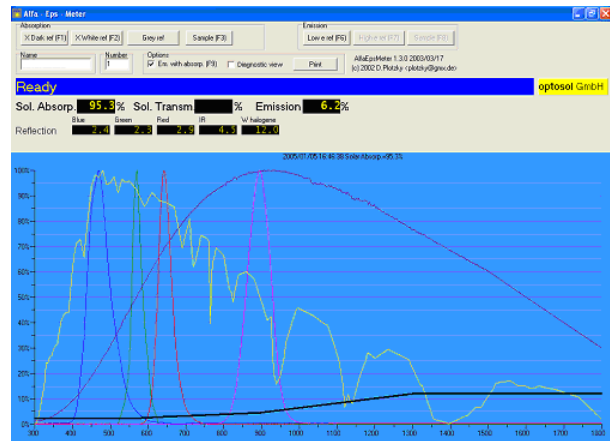
# SolMax – Quality

**SolMax** is manufactured by a continuous process to assure consistency of quality. Statistical process control (SPC) and other techniques are used throughout production to ensure that our processes are performing to design specification. The solar selective optical properties are closely and accurately monitored using our Optosol measuring system.

The raw materials required to produce **SolMax** are carefully chosen from established suppliers who work to internationally recognised quality systems.



Some sample material undergoing test. Numerous measurements are taken to constantly monitor the quality of the finished product



Example of the Optosol measurement screen. The finished product is tested and a copy of the optical properties despatched with each batch.

## SolMax and the ENVIRONMENT

Our aim is to avoid pollution to the environment. By supplying our product into the solar thermal market we are contributing to reduction of CO<sub>2</sub> emissions that are considered a major contributor to global warming. Continuous development of new products and working with our customers to produce specialist products increases the benefit.

Throughout the processing of **SolMax** potentially hazardous situations are closely monitored and controlled to ensure no environmental damage is ever caused. Our culture is to promote the careful use of energy and the reduction of waste at all stages of the process.

The packaging for **SolMax** has been carefully designed to produce an incredibly strong yet compact box system, which provides a very high level of protection for the goods and enables easy and tidy storage that will take up little room. The box is made from 80% recycled material, 20% managed sustainable resources, glues that are recycling friendly and are accepted throughout the world.

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# SolMax – Supply forms

**SolMax** is supplied in various standard forms to suit specific customer requirements.

The most common forms are:-

- Silicone adhesive backed.  
For general flat plate collector manufacture.
- Expansion ridged with silicone adhesive.  
To accommodate the difference between expansion coefficient of aluminium substrates and **SolMax** nickel foil.
- Plain without adhesive.  
For production of air collectors.

Normal supply width is 250mm however other widths are available upon request.

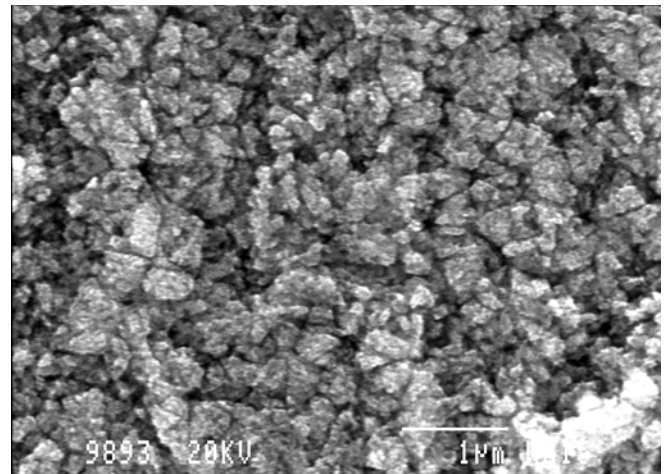
**SolMax** is supplied in roll form in deliveries ranging from 20m<sup>2</sup> to >100,000 m<sup>2</sup> at call off rates to meet customers requirements.

We are always interested to work with customers to develop special products or variations on standard products.

By changing our processing parameters it is possible to produce selective surfaces with other values of absorptivity,  $\alpha$  or emittance,  $\epsilon$ . This is beneficial in the construction of some types of collectors and is often used in space exploration and satellite thermal control systems.



Scanning Electron Microscope being used to examine **Solmax** surface.



SEM photomicrograph of **SolMax** surface texture

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