Smart Membranes
For Solar / P.V. Module Lamination
with first class performance
J-Flex is a leading UK elastomer solutions provider. Solutions include high performance elastomer sheetings for gasket conversion and lamination applications plus manufactured elastomer components such as; mouldings, extrusions, bellows, seals, sleeves and expansion joints.

VAC-SIL® Quality Membranes have been specifically designed to be used as vacuum membranes for Solar/P.V. module lamination plus forming or thermo-pressing vinyl foil veneers on woodwork and composites in aerospace, F1 cars, marine and other general products.

Listening to our valued customers and their experiences, VAC-SIL® Quality Membranes have been polymer engineered to give users excellent thermal and mechanical properties, with good chemical resistance that leads to optimum service life.

VAC-SIL® Quality Membranes bring many positive advantages including:

- Laboratory controlled membrane production
- Material totally post-cured = maximum mechanical properties
- Membranes up to 3850mm wide
- Membranes precision cut using CAD and digital cutting equipment
- Holes, slots & curves – no problem!
- Huge stocks of base materials
- Membranes ex-stock or delivery by agreement
- Unique VAC-SIL® 9 Point Quality Plan
- Premium product packaging
- Excellent cycle life – up to 10,000 cycles guaranteed*
- Temperature resistant
- Great strength & tear resilience
- Excellent release properties

*Subject to terms and conditions – for more information download our White Paper, “Reducing the Total Cost of Ownership of a Solar / P.V Laminator” at www.j-flex.co.uk
Relative Properties of **VAC-SIL** Grades

**Advantages**
- Unique Light Blue colour
- EX-STOCK for immediate despatch
- Most economic grade
- Widely used in 3mm – but also 4.5mm
- High Temperature +200°C

**Advantages**
- Unique Blue/Black composite 3.8mm thick
- 1 layer fabric reinforcement – tough construction
- Black gas side – Peroxide / E.V.A. Resistant Barrier
- Maximum UPTIME

**Advantages**
- Unique Green/Black composite 3.8mm thick
- Black gas side – Peroxide / E.V.A. Resistant Barrier
- 1 layer fabric reinforcement – tough mechanical strength
- Most cost effective grade
- EX-STOCK for immediate despatch
- Maximum UPTIME

**Advantages**
- Unique red/black composite 3.1mm thick
- Black gas side – Peroxide/E.V.A. Resistant Barrier
- Guaranteed for long life
- Ex-stock for immediate dispatch

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**P.T.F.E. / Glass Belting Products**

- High quality Stringer Belts – endless/ perforated giving great tracking & dimensional stability
- Release Belts
- Transport Belts
- Platen Sheets

All items fabricated promptly to order requirements
Established in 1984, J-Flex is a privately owned company involved in the manufacturing & distribution of High End Sheet Products. Over this time our manufacturing facility has gained an enviable reputation for high quality elastomeric sheets & P.T.F.E fabrics & belts.

Our Production Facilities are laboratory controlled and we are ISO9001 approved. J-Flex is also a member of the official Chemours Viton™ licensee programme.

J-Flex currently exports to over 50 countries worldwide.

Each VAC-SIL® Membrane from J-Flex passes a 9 point Quality Plan ensuring the best quality possible time after time. VAC-SIL® Quality Membranes conform to current Reach / SVHC requirements.

An active R & D programme keeps J-Flex at the forefront with top quality & innovative product offerings - for example VAC-SIL LAMIN8®.

Sounds like perfection: Sounds like J-Flex
Smart Membranes
For Solar / P.V. Module Lamination
with first class performance
The following guidelines are based on our observations and experiences in the Solar Industry and we try to give you assistance based on best practice.

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**RECEIPT, INSPECTION AND STORAGE**

Goods inward inspection should be carried out as soon as the products arrive from J-Flex. Check the condition of the ordered Membrane + sizes and quantity supplied.

It is important to check that each Membrane is marked with the re-assuring VAC-SIL® brand name. **VAC-SIL® is your guarantee of quality.**

Each VAC-SIL® Membrane is allocated a unique and fully traceable batch number. Apart from being one of the 9 point quality checks - this item can be fully traced back to the raw material batch used; the production date and final inspection process. Therefore in the unlikely event of a problem it is vital that you quote this traceable batch number.

Store VAC-SIL® Membranes inside the original packaging. Do not place heavy objects on the packaging.

Store in dry, clean conditions and in temperatures as near ambient as possible, away from direct sources of heat such as boilers, radiators and direct sunlight.

Generally in accordance with ISO2230 and if stored as above a minimum shelf life of 10 years can be considered.

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**BEFORE / DURING ASSEMBLY**

- Switch the laminator to the “Manual” mode of operation.
- Ensure no modules located in laminator or on the conveyor belts.
- Remove old membrane.
- Load VAC-SIL PRO® Light Blue Membrane with the fabric impression (matt textured) face down against the module surface.
- It is vital that VAC-SIL® LAMIN8 or VAC-SIL LAMI-FLEX® Membranes are loaded with the black coloured Peroxide / E.V.A. resistant face down against the module surface.
- Further protection and life expectancy can be guaranteed by inserting a PTFE / Fabric release sheet between the membrane and module. See service and maintenance notes below.
- Place the new membrane spread out on the heating plate and heat laminator to 140°C for approx. 30 minutes.
- Flatten the membrane out and heat again for 30 minutes.
- A total of at least 1 hour can prevent wrinkles caused by insufficient stretching.
- After heating the membrane needs to be stretched by about 1% to effect installation.
Not to pull the membrane too tightly.

Ensure it is tensioned sympathetically.

Do not subject the membrane to heavy tensile loading.

To recognize if any long-hole formation (bearing stress).

Ensure the membrane is not sagging.

That threaded bolts are aligned with respective bolt holes of the laminator cover.

Maybe worth ensuring that the top chamber is always set at vacuum so when opened this will keep the membrane lifted by vacuum and stop it sagging.

That screws are not over torque.

Check that vacuum in top and bottom chambers is appropriate to the membrane – excessive pressure can seriously overload the membrane and shorten its life expectancy.

Never try to operate vac or press without ensuring the holding / fixing arrangements are properly fixed / tightened.

It is important to follow prescribed instructions or it may shorten the life expectancy of the membrane.

Whilst installing a membrane try and maintain a slight 2% droop angle.

After installation it may need several closures to check that the membrane is not wrinkled & has created a good vacuum seal. If a wrinkle or sag of more than 2% is observed, stretch the blanket and rectify accordingly.

Remember the “variables” in the lamination process - temperature; time; pressure (upper & lower chambers) + type of encapsulant. All of these aspects could have an affect on the membrane performance.

Ensure at all times that when the top chamber is closing it should be at VAC position. Ensure that sag / droop / extra blanket should not get stuck between top and bottom chamber.

Blanket can be stretched between 3 to 5% depending upon the length and width of the membrane.

In the laminator if the stretching is achieved by the cylinder ensure the correct pressure is set to achieve the required stretching.

If everything is good to go - commence production.
VAC-SIL® Membranes are wear and tear consumable parts, but to obtain maximum service life we recommend routine inspection each shift.

Best performance of Membranes is achieved by continuous running of laminator at the normal process temperature (140°/150°C). ‘Stop start’ production where temperature drops and is then ramped up again can shorten the rated performance by 500 /800 cycles. It is also necessary to check and restore vacuum to the designated process temperature for more than 2 hours before re-commencing production.

Regular cleaning of EVA deposits could help. If deterioration is spotted, spare parts can be ordered in time so that membranes can be changed at the first available opportunity.

Re-tensioning the membrane regularly can alleviate the stresses that attack the usual corner / side weak points.

Avoid sharp edges and to clean EVA stuck on the membrane.

To extend life of membrane insert PTFE / Glassfabric between the membrane and modules to avoid the contamination caused by EVA residue. (We do have stock options available – just talk to us).

Ensure that there are no breaks, cracks or holes in the PTFE belt to avoid seepage of EVA coming into direct contact with the membrane.
### F.A.Q'S

Frequently Asked Questions

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<tr>
<th>Q.</th>
<th>What Thickness and Tolerances are VAC-SIL® Membranes made to?</th>
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<tbody>
<tr>
<td>A.</td>
<td>VAC-SIL® Membranes are manufactured in accordance with International tolerance standards and these are confirmed for the most popular thicknesses as follows: -</td>
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<tr>
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<td><strong>VAC-SIL PRO®</strong> : 3mm (+/-0.3mm) &amp; 4.5mm (+/-0.3mm)</td>
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<td></td>
<td><strong>VAC-SIL LAMI-FLEX®</strong> : 3.8mm (+/-0.38mm)</td>
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<td><strong>VAC-SIL® LAMIN8</strong> : 3.8mm (+/-0.38mm)</td>
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<td><strong>VAC-SIL® LAMIN8 LITE</strong> : 3.1mm (+/-0.3mm)</td>
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<th>Q.</th>
<th>What standard of packaging can you expect with VAC-SIL® Membranes?</th>
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<td>A.</td>
<td>Membranes are rolled onto a cardboard tube interleaved with polythene, then packed inside a heavy duty cardboard tube, which is then packed inside polypropylene sacking.</td>
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<th>Q.</th>
<th>What is the correct way to store stocks of VAC-SIL® Membranes?</th>
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<tr>
<td>A.</td>
<td>After goods inward inspection of membranes upon receipt, we suggest you store inside the packaging. We then recommend you store in accordance with ISO2230, which generally suggests “storage temperature should be below 25° C and products should be stored away from direct sources of heat such as boilers, radiators and direct Sunlight.”</td>
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<td><strong>If you need further help with this just ask – we are there to help.</strong></td>
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<td><strong>Q.</strong></td>
<td><strong>How are the physical properties of VAC-SIL® Membranes measured?</strong></td>
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<tr>
<td><strong>A.</strong></td>
<td>J-Flex use tangible world class rubber norms to measure the physical properties of VAC-SIL® Membranes. Typically ISO or ASTM specifications – see material data sheets.</td>
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<th><strong>Q.</strong></th>
<th><strong>Are the ingredients used in VAC-SIL® Membranes safe and fit for purpose?</strong></th>
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| **A.** | This is a very good question and we confirm that most of our recipe ingredients are of European origin. As such we have fully traceable Material Safety Data Sheets (M.S.D.S.) and these are available upon request.  
All of the raw material ingredients have been tested for compliance and guarantee that no banned substances are included in our finished product. |

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<th><strong>Q.</strong></th>
<th><strong>What is the best membrane for your application?</strong></th>
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| **A.** | A VAC-SIL® Membrane of course - but this is a really vital question. There is no one answer that is right for everybody. There are many factors that can effect the choice of membrane for example:-  
- type of encapsulant (eva etc.)  
- make up of p.v. / solar module  
- type of laminator  
- operating cycle – time/temperature  
- budget constraints  

*We would be delighted to discuss your own specific requirements further.* |
Q. How long should a membrane last?

A. This is really very subjective as operating conditions and controls can be so very different from company to company. For example we have one very large European customer who has modified the encapsulant used and strictly controls their production process - so much so they achieve over 10,000 cycles using our standard VAC-SIL PRO® Membranes.

Typically we are suggesting :-

VAC-SIL PRO® - 2,000 cycles + VAC-SIL LAMI-FLEX® - 5,000/6,000 cycles.
VAC-SIL® LAMIN8 - 10,000 cycles.

As there are a number of variables beyond our direct control, it is very difficult to “guarantee” an exact cycle life - however, J-Flex will always be fair with our valued customers.

Q. What can be done to extend the life of membranes?

A. A whole host of things can be done including - correct fitting and tensioning; regular maintenance checks; regular cleaning of eva deposits. In addition you could protect the membrane with a layer of PTFE / Fabric release sheet between the modules and the membrane. (We do have stock options available – just talk to us).

If you need eva resistance our VAC-SIL LAMI-FLEX® or VAC-SIL® LAMIN8 Membranes have great resistance to outgassing and give far better life than standard membranes.

See test results on back of material spec. sheet.

Q. Is it wise to use membranes with seamed joints?

A. In our opinion joints are mechanically weak areas. Continuous “draw down” under vacuum conditions will search out any weaknesses in the seam and lead to early membrane failure. In addition seams can sometimes leave unwanted impression marks on modules -

- NOT WHAT YOU WANT

For J-Flex 1 piece sizing is not a problem. For you today we can offer VAC-SIL® Membranes up to 3850mm wide in 1 piece - REPEAT 1 PIECE.
Q. Does colour or surface finish have any impact on membrane performance?

A. Based on feedback from customers worldwide, we can see no advantage or disadvantage of different colours, or indeed surface finish. For this reason we offer:-

- **VAC-SIL PRO®** in Light Blue
- **VAC-SIL LAMI-FLEX®** in Blue / Black
- **VAC-SIL® LAMIN8** environmentally inspired in Green / Black
- **VAC-SIL® LAMIN8 LITE** unique Red / Black colour

**WHY?** Most of our competitors offer a standard Grey or Translucent and this makes it very difficult to differentiate between suppliers. J-Flex offer these distinctive colours to distinguish materials. For better or worse J-Flex don’t hide away from our responsibilities.

It is vital that **VAC-SIL® LAMIN8** or **VAC-SIL LAMI-FLEX®** Membranes are loaded with the black coloured Peroxide / E.V.A. resistant face down against the module surface.

We find the question of surface finish interesting - but in conclusion we see no evidence that one option is better than another. Commonsense says that a fabric impression will provide a natural venting path to aid release especially in hot / sticky conditions. Most of our customers do prefer fabric impression 1 side and smooth 1 side.

The physical properties of the material will be exactly the same irrespective of colour or surface finish - these do not change.

**DISCLAIMER:**

The information contained in this document is intended as a guide to best practice and does not necessarily represent a guaranteed solution to any problems being encountered. J-Flex cannot be held responsible for any issues arising from application problems.