

## **PRODUCT PERFORMANCE WARRANTY**

To,

M/s ESSEN MULTIPACK LIMITED herein after referred as “EML” undertakes that the greenhouse covering films manufactured and sold by “EML” under trade name of “SUNCOOL” are thoroughly inspected by team of experts of production and quality control departments before despatch.

We confirm that our greenhouse films of 200 micron have been stabilized for radiation intensity of 180-200 Kly and will last for 33 months. The under mentioned instructions must be followed when covering the greenhouse with our UV stabilized films.

### **Instructions for handling and installation of film:**

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#### **A. Instructions for storage of film:**

- 1 The films must be stored on a smooth surface in horizontal position in an enclosed shade, out of exposure to direct sunlight.

#### **B. Guidelines for greenhouse structure:**

- 1 Metal tubes: The metal tubes must be clean, polished and preferably zinc galvanized. As higher concentration of Fe is detrimental to the life of the film and Fe acts as a photo-oxidant and pro-degrading agent. The angles & radius of the tubes should be well designed to give uniform tension across the film. The structure should give enough support so that there is no flapping of the film.
- 2 Wooden framework: The wood should be devoid of any sharp or protruding edges and must have a smooth surface. Before selecting the type of wood, one should ensure that it does not excrete any substance, which is detrimental to life of the film. (E.g. pine wood must be avoided)
- 3 Ensure that the framework is sturdy especially at the joints. If any components are loose or broken they ought to be rectified.

**C. Preparations before installation of film:**

- 1 It is recommended that slats/locking channels/grippers made from aluminum be used instead of the ones made from PVC. Enough slats/grippers must be provided to be able to follow the contour of the arches avoiding sharp edges/bends. They must be tightened so that they do not move against the film.
- 2 All metal or wooden parts that are in contact with the film must be painted with a white acrylic-based paint.

**D. Installation of the film:**

- 1 While installing the multilayer film, first ensure that the respective layers are facing the right direction (i.e. inside or outside) as shown on film or instruction supplied along with the film.
- 2 It is advisable to keep a sample piece of 1 m<sup>2</sup> (One sqm.) along with the manufacturer's identification mark.
- 3 The film should be installed in early hours of morning on mild days when the ambient temperature is cooler (15-23<sup>o</sup>C) and there is no wind. When positioning the film it should be tensioned tightly enough so that there is no flapping of film on windy days.
- 4 Attention should be paid that proper care is taken so that the film is not damaged or torn during installation. The ideal method is to place film on the top and unroll along the length of greenhouse any other method should be avoided.

**E. Protection of film:**

- 1 White acrylic-based paint must be applied on the film wherever it comes in contact with the construction frame of greenhouse. If not, the film becomes warmer in the contact areas and is prone to faster degradation. Also the metal contact fastens the oxidation process leading to early degradation. It should be always checked that the Iron (Fe) residues on the film do not exceed 50 ppm at any given time.

**F. Ongoing maintenance of film:**

- 1 Any holes or tears must be repaired immediately with a special adhesive tape (non PVC) designed for application in polyethylene films.
- 2 Whenever required the film, should be re-stretched between the seasons or after strong winds so as to maintain the even tension of the film.

**G. Ventilation and irrigation:**

- 1 The greenhouse must be suitably aerated, especially in summer season even if it is empty. This is to prevent overheating of the greenhouse. The area provided for ventilation should be at least 20% of the ground surface.
- 2 The greenhouse must be irrigated once a week even when there is no cultivation within so as to maintain the humidity within the structure. A drastic drop in relative humidity has a negative effect on the life of film.

**H. Crop Protection Chemicals (CPC):**

1. CPC's based on Sulphur, chlorine or halogens have a catalytic effect on the degradation process of film. Hence any direct contact of CPC's with the film should be avoided. However to better ensure the stability the following limitations with respect to the usage of chemicals must strictly adhered to.

Chemical name	Spraying limit	Residual limit
Sulphur	1500 ppm	500 ppm
Chlorine	150 ppm	150 ppm

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## **WARRANTY FOR FREE REPLACEMENT**

- 1 If all the above-mentioned conditions are met and still the tensioned film fails then the liability of EML can be called upon. The film is considered to be degraded by UV radiation if the film loses its flexibility & becomes brittle. EML extends this warranty in case of such defects only and undertakes to replace at the discretion of EML; leading to a failure in performance within a period of 33 (thirty three) calendar months from the invoice date. Provided the film is still in possession and the proper instructions given herewith are followed, which upon examination / testing will reveal to the satisfaction of EML, to be having degraded due to UV radiation. Any other defects or damages are excluded from this warranty & any liability of EML.
- 2 The liability is only to extent of the film that is damaged by UV degradation due to manufacturing defect in the film. It does not cover mechanical failure due to improper handling & installations, natural calamities or malicious damage. Also the liability is limited up to invoiced value of the film only and not other consequential expenses / losses / freights / testing charges or so.
- 3 The replacement would be for the quantity of film proved defective and will be calculated on PRO RATA basis i.e. to extent of net invoiced value for the remaining number of months in the warranty period.
- 4 First the defective film has to reach to EML along with the original invoice copy & the modvat invoice copy, before the release of replacement.
- 5 EML shall not be held responsible in case of delay in replacement, when delay is due to unavailability of raw materials, natural calamities, riots, breakdowns and or other similar reasons beyond human control.
- 6 Replacement shall be availed in form of the same product only and cannot be exchanged in lieu of other product, cash, or any other form.
- 7 All inputs used in the greenhouse should be thoroughly checked for their adverse effects, if any, on the film before using the same and before installation of the film.
- 8 Any disputes shall be subject to finalisations within the jurisdiction of Rajkot only. EML reserves the last saying in appointment of the arbitrator or negotiator, and venue of arbitration being RAJKOT only.

For **ESSEN MULTIPACK LTD.**

Authorised Signatory.