
İSTANBUL
SERA®
PLASTİK

SERA®
hayatı kaplıyoruz

WE COVER THE LIFE

Sera Plastik was established in 1969 to produce plastic products. The company has focused on the production of agricultural films since 2000, and is today able to produce any kind of agricultural films (greenhouse covers, solarisation and mulch films, silage covers and thermal screens) and agricultural packages (fresh vegetable – fruit bags, seedling bags, silage bags, soilless agricultural bags) needed by the sector at its plant having an area of 55.000 sqm with an indoor area of 12.500 sqm in Organised Industrial Zone of Antalya.

Leader of the sector in the field of production technology applications, Sera Plastik is the first company of Turkey producing 3-layer agricultural films, thanks to the its investment in co-extrusion film production lines in 2006.

Our principle is to provide the same service quality and product ranges to all customers in any scale, whether an amateur producer or a professional agricultural plant.

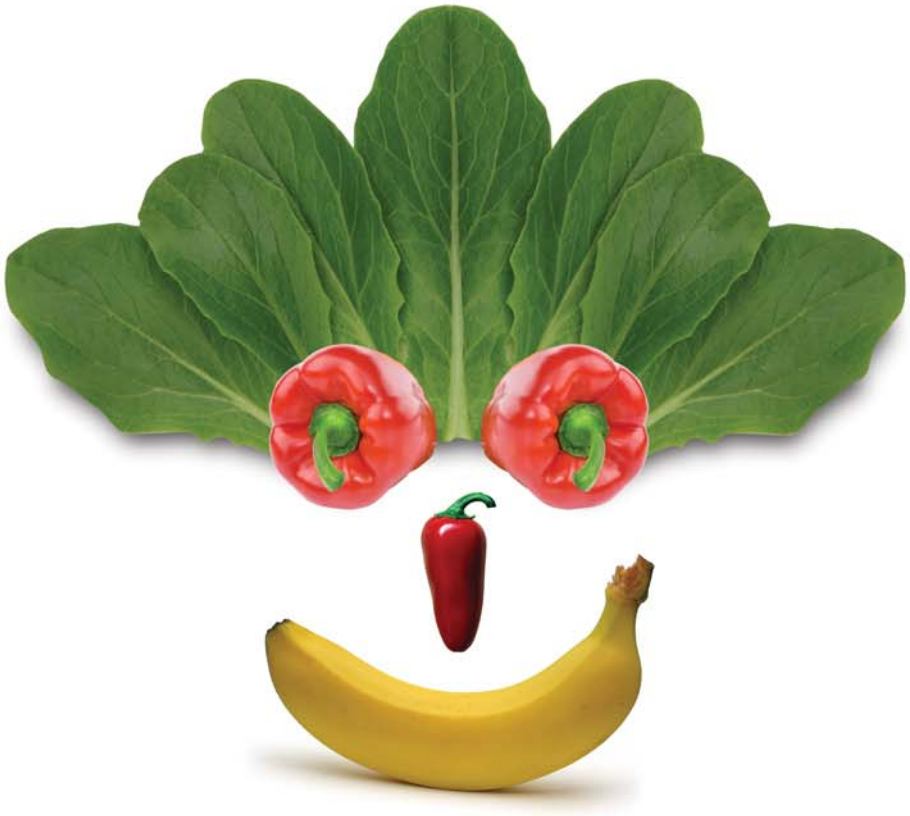
With its 42-year experience in film processing, specialist staff members and advanced technology that it uses in production, our company develops products serving to enhance efficiency, thereby providing added value to its customers.

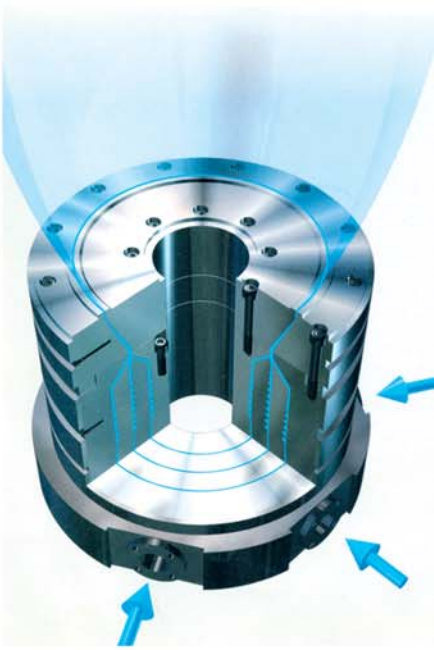
We are aware of our responsibility for increasingly continuation of our contribution to the greenhouse cultivation in the future.

İSTANBUL SERA® PLASTİK

AGRİ TARIMSAL ÖRTÜLER

SERA PACK
Flexible Ambalaj





PRODUCTION TECHNOLOGY

Today, high quality agricultural films are produced with varying features, raw materials and additives.

Raw materials and additives used for production of film with traditional production technology (i.e. mono-extrusion) may have incompatibility with each other and thus, result in poor quality films, which in turn affect the yield of the crops negatively.

On the other hand, films are produced as multilayered in the new generation production technology (i.e. co-extrusion) which allows each layer to have specific features.

Production of films with suitable number of layers, having proper additives in proper formulas, leads to high quality products with appropriate features.

We are producing our agricultural film products as 3-layered, using production lines with co-extrusion technology included in our machinery.

GREENHOUSE COVERS

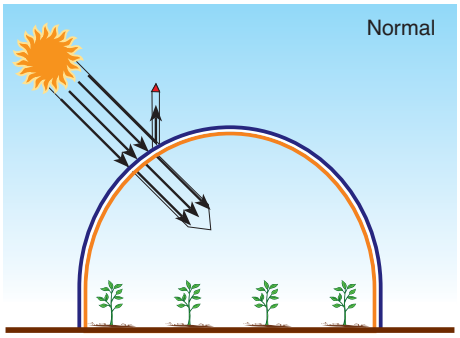
Greenhouses provide ideal environment for the growth of plants (vegetables, fruits and flowers), protect plants against external effects such as rain, wind and cold weather and accelerate the growth of the plant with the balanced environment inside them. This allows harvesting more than once in a year. With the new generation production technology and proper formulas used therein, greenhouse covers may have optional features of solar resistance up to 60 months, light and heat control, prevent humidity and fogging and resistance against sulphur and chlorine chemicals. Solar resistance period, thickness and other optional additives of greenhouse covers are determined according to the intended application (flower, vegetable, fruit, traditional agriculture, soilless agriculture, geothermal application, etc.) and the location where it will be used.

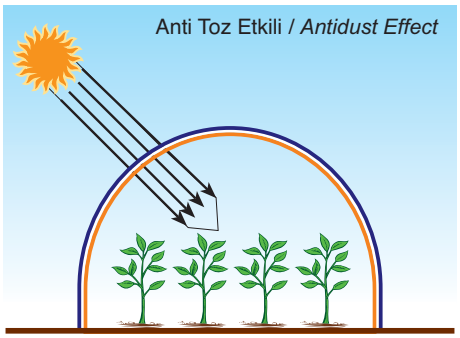
Our range of greenhouse covers by solar resistance periods: PE Cover (3-month resistance), 9, 12, 24, 36 and 60-month resistance.

Optional features described in the section of additives are added at the stage of production upon request.

For best results of the greenhouse covers, please follow the instructions given in the section of the operating instructions.

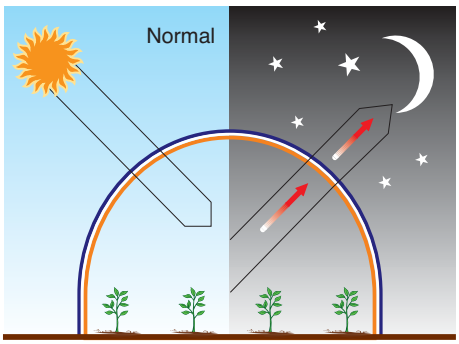
Anti Toz / *Antidust*

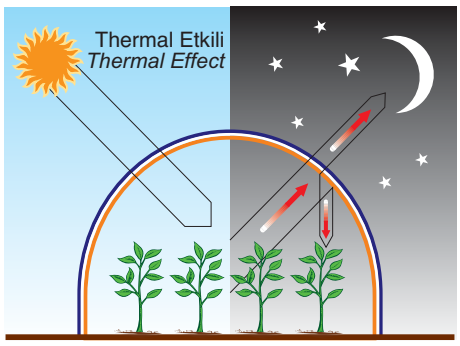




After the greenhouse is covered with the greenhouse cover, the dust in the environment sticks on the cover. This incident gradually causes a reduction in the sun lights entering into the greenhouse. And reduction of sun lights cause diseases in the plants. This additive ensures that dust, stuck on the outer surface of the plastic, can be easily removed with the help of wind and rain. Thus, light transmission of the greenhouse cover continues to be high for a long time.

Thermal (IR)+EVA





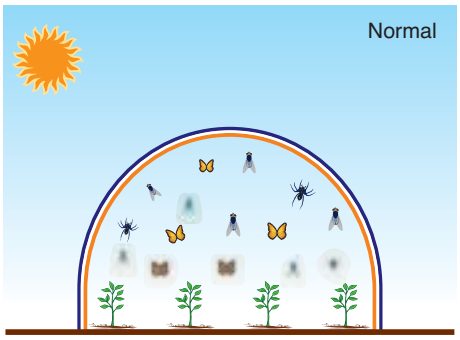
Helps slower cooling of the greenhouse in night time, which was warmed by sun lights during the day. Minimizing the heat loss protects the harvest against the risk of freezing, in thte case of sudden temperature decreases. Reducing the temperature difference between the day time and night time improves productivity. Ensures temperature advantage between +1°C to +5°C, and fuel saving in heated greenhouses.

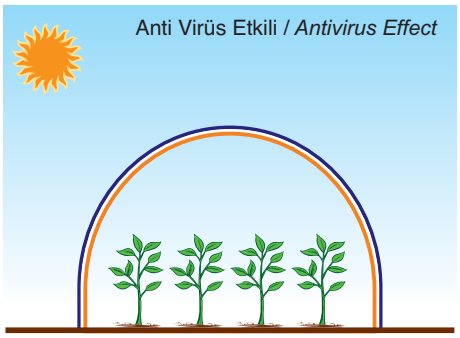
EVA additive helps thermal feature to be more efficient.

We use EVA additive as a standard, in greenhouse covers with thermal (IR) additive.

Anti Virüs / *Antivirus*

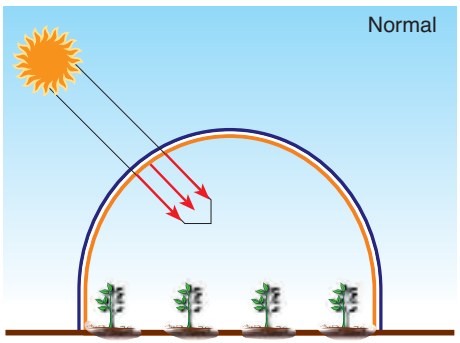
With its special optic structure, reduces the vision and blinds the direction finding senses of pests like whiteflies, thrips, aphids. Helps prevention of fungal diseases and viruses. Reduces pesticide use, product quality increases.

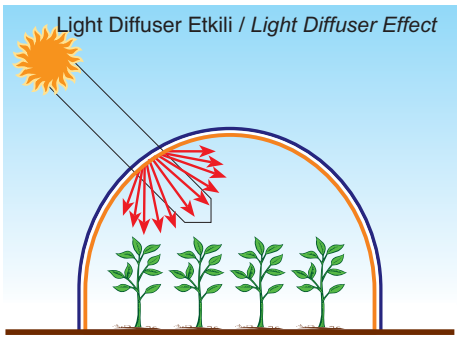




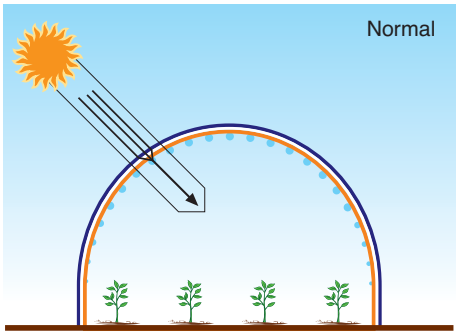
Light Diffuser

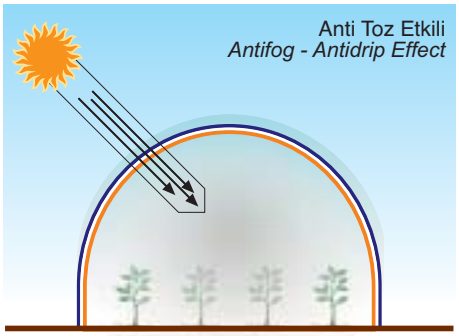
Ensures sunlight to diffract and diffuse when entering into greenhouse.This prevents plants to shade each other.Prevents burning of plants in sunny and clear days. Helps growth of plants and fruits.





Anti Fog - Anti Drip





Transpiration occurs in the plants and land because of the high temperature difference between the interior and exterior of greenhouses, and water drops are formed on the inner surface of the greenhouse cover. These water drops prevent some of the sun lights to enter the greenhouse. And the rest of sun lights entering into the greenhouse cause burning of the plants and some diseases because the water drops act as a lens.

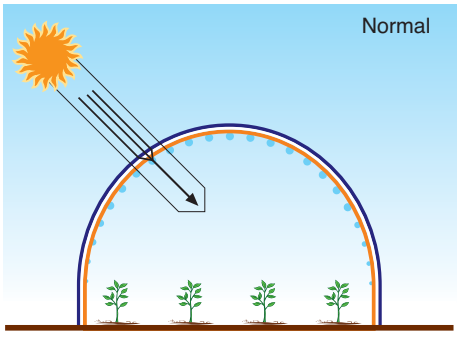
Antifog - Antidrip additive prevents humidity in the greenhouse to remain on the inner surface of the film as sizeable water drops.

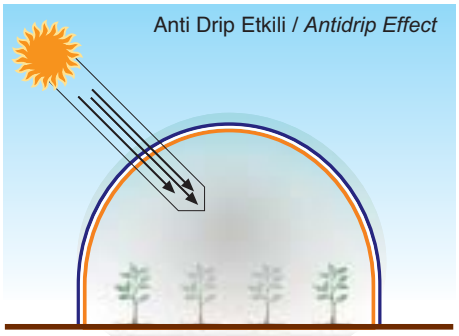
As this feature is included in only one surface of the greenhouse cover, attention should be paid to the warnings on the film.

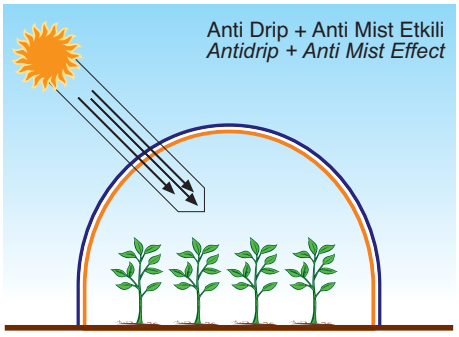
Drops not remaining on the surface cause fog in the greenhouse. It is necessary to evacuate this fog layer. This process can be made by opening the sides of the greenhouse, through natural ventilation or by using fans. Fog not evacuated from the greenhouse for a long time may stick on the plant or fruits, and causes diseas

Anti Mist

It is used to prevent the fogging problem caused as a side effect by the use of antidrip additive.





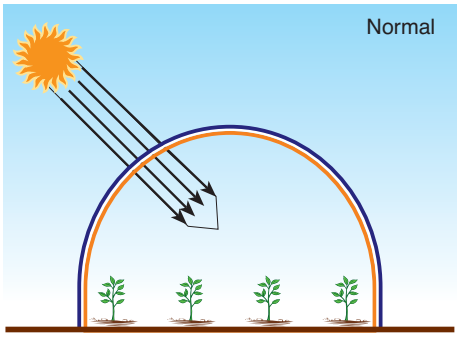


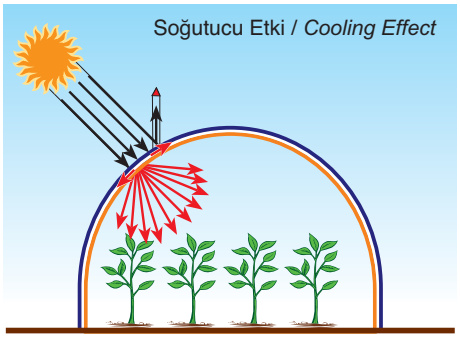
Soğutucu Etki / Cooling Effect

In the areas where sun rays are strong, when the weather is warm or if growing shadow loving plants are cultivated, the interior of greenhouse should be cooler than outside.

Cooling effect reflects, absorbs and refracts the sunlight to prevent the internal temperature of the greenhouse from increasing in daytime.

Greenhouse covers with cooling effect warm slower than the greenhouse covers without such effect in the morning time.





Kimyasal Direnç/Chemical Resistance

Agricultural chemicals are often used to prevent the occurrence or spread of diseases to crops and to protect the crops against pest infestation. They may contain active halogens such as sulphur and chlorine.

Sulphur and chlorine interact with the UV Stabilizer in the film, thus spoil the polymer.

The chemical resistance additive makes the agricultural plastics resistant against sulphur and chlorine.

Please see the section of operating instructions for the limits of the chemical resistance additive.

SOLARISATION COVERS

Many diseases in the greenhouse soil may be prevented by use of solar power.

Solarisation is a method of using solar power and plastic film for decontamination of the soil from damaging organisms. Resistance of some pathogens is broken with the increase of the air temperature. The success of the solarisation process increases with higher temperatures of the soil.

As long as the correct film is chosen and the process is applied properly, solarisation ensures the healthy growth and high quality of crops and saves on pesticides.

There are 2 types of film for this process.

Thin Cover

* It is produced as 3-layered for the solarisation process.
* The most economic product for the solarisation process.
* Produced with high transparency.
* Its permeability of direct light is 95%.
* Film thickness is 20 microns.
* Maximum width of film is 8 meters.
* Quantity for the solarisation of 1000m^2 area is 21 kg.

Sera Solarize Film®

* It is produced as 3-layered with a special formula for enhancing the efficiency of the solarisation process.

* It has a thermal barrier, thereby restricting the heat transfer from the soil to the external side of the film.

* It has a gas barrier, thereby restricting the gas transfer to the external side of the film in applications where chemicals are used.

* It ensures to obtain higher temperatures than the ordinary plastic films at the same soil depth.

* Comparing to ordinary plastic films, a temperature difference up to 10°C occurs at a soil depth of 18-20 cm in the second week of the application of Sera Solarize film. Such temperature difference enhances the efficiency of the Solarisation process.
* Film thickness is 25 microns and colour of the film is light yellow.
* Maximum width of film is 10 meters.
* Quantity for the solarisation of 1000m^2 area is 26 kg.




MULCH COVERS

Please find below the advantages of mulch films that may be used for production of any vegetable and fruit, being covered on the soil to prevent the contact between the crop and soil:

* Higher quality crops.
* Saving on water
* Minimisation of weeds
* Control of soil temperature
* Disinfection of soil before planting

The features of the mulch covers such as their resistance period, width, thickness and colour should be determined according to the intended application of the cover.

Black: It prevents the contact of the crop with the soil, inhibits any growth of weed and protects the moisture and temperature of the soil. It saves on irrigation, disinfection and fertilisation costs.
Transparent: It prevents the contact of the crop with the soil and ensures the soil to warm due to its high permeability of light.

Black – Silver Grey: It prevents the contact of the crop with the soil, inhibits any growth of weed. With the reflection feature of Silver Gray, it ensures the leaves and lower parts of the plant to get sunlight. It decreases bacterial growth in the lower parts of the leaves, thereby helping uniform colour distribution on fruits.

Repellent of certain insects. With the reflection feature of silver gray; it ensures the leaves and lower parts of the plant to get sunlight, provides high yield and precocity, as this reflection contributes to extra light for the plant (however it is not as much as the black – white film). It avoids the risk of burning plant which contact with the film, as this warm up much lesser than the black film. Black side of this film should contact with soil.

Black – White: It prevents the the contact of the crop with soil, inhibits any growth of weed. Repellent of certain insects With the reflection feature of white; provides high yield and precocity, as this reflection contributes to extra light for the plant. It avoids the risk of burning plant which contact with the film, as this warm up much lesser than the black film.

	Colour			Thickness (micron)				Field and Period of Application			
								Interior of Greenhouse	Outdoor		
Description of Product	Transparent	Black	Silver Grey - Black	10	25	30	40	Seasonal	Seasonal	12-month	24-month
Mulch Film	x	x		x				x			
Mulch Film		x				x			x		
Mulch Film		x					x			x	x
Super M. Film		x			x					x	x
Silver Grey-Black			x				x			x	

SILAGE COVERS

Advantages of the silage covers produced to protect the silages installed to supply fresh forage for livestock in fatling and dairy farming against external effects are listed below:

High mechanical resistance values.

Light permeability is 0%. It is opaque.

Tightness.

Keeping its features as long as the life of silage.

UV Stabilizer added. Long life span.

Colour	Black / White, Black / Green
Width	up to 12 meters
Thickness	150 microns
Length	On request

Black side of the silage cover should contact with silage.

THERMAL SCREEN

* Preservation of the internal temperature of the greenhouses in cold weathers is very important, though costly, for the development of the crops.

* Thermal screen is used for preservation of the internal temperature of the greenhouse. It is the most economic solution for this purpose.

* Upon request, it can be produced to have thermal and antidrip features.

* Its penetration of light is 95%. It does not therefore affect the development of the plant negatively.

* Its film thickness is 20 microns.

* Maximum film thickness is 8 meters.

* The quantity needed to cover a 1000 sqm greenhouse with thermal screen is 21 kg.

GROWBAG
(SOILLESS AGRICULTURAL BAGS)

These are the growbags used in soilless agricultural bags. It contains UV stabilizer and has a long life span. It internal side is black and external side white, having a 0% penetration of light. Its thickness is 100 microns. It is produced according to the width, length, thickness and volume demanded by the customer.

SEEDLING BAGS

They are used to grow the seedlings of plants, fruits and flowers.

They contain UV stabilizer and have a long life span.

Please see the standard product features in the following table:

Dimensions of the Seedling Bags

Width x Lenght (cm)	Gusset (cm)	Quantity (cm^3)	Volume Piece / Kg
8 x 13	2,5 + 2,5	420	427
10 x 20	3 + 3	1020	188
12 x 20	4 + 4	1536	150
12 x 25	4 + 4	2016	120
15 x 25	5 + 5	3000	87
15 x 30	5 + 5	3750	72
15 x 35	5 + 5	4500	62
18 x 30	6 + 6	5184	60
18 x 35	6 + 6	6264	51
20 x 30	6,5 + 6,5	6110	50
20 x 35	6,5 + 6,5	7410	43
20 x 40	6,5 + 6,5	8710	37
25 x 35	8 + 8	10800	30
25 x 45	8 + 8	14800	23

IRRIGATION AND AIR HOSES

Easy-to-use irrigation hoses are used especially for the irrigation of outdoor areas. They contain UV stabilizer and have a long life span.

They varieties range from 8 cm to 30 cm.

Air hoses are used to carry the warm air produced in the heating systems to other locations in the greenhouse. They are easy to install, contain UV stabilizer with a long life span.

1. OPERATING INSTRUCTIONS

The life span of Agricultural Films means the period of their resistance to the degrading effect of the sunlight (UV degradation).

Specified solar resistance periods are valid for140 kly/year.

Life span of an agricultural film depends on the conditions of production as well as the manner of application.

The following instructions must be observed to get the highest yield from the agricultural films.

The agricultural films that we produce are warranted for the period specified on the product against degradation due to the damaging effects of the sunlight only if the following instructions are observed.

User should determine the life span, optional features and thickness of the product considering the climate conditions of the area where the agricultural film will be used, type of construction and properties of the crop.

Correctness of the order should be checked at the time of purchase. Product details are stated on the product label.

Agricultural films should be stored in their original packages in a cool and dry environment away from sunlight.

Rolls should be stored horizontally on a smooth surface.

Storage period should not exceed 6 months.

Rolls should not be moved by pulling or dragging on the floor.

Warning statements or signs showing the direction of the agricultural film should be observed. "Inner side" means the side of soil and "external side" the side of sky.

If the greenhouse construction is metal (iron, galvanised, steel, etc.), all points of the construction that will contact the greenhouse cover should be smooth, burr-free and painted with water-based opaque white paint.

For preventing any deformation that may be caused by heat, the surfaces of the greenhouse construction that may contact with the greenhouse cover should be sheathed with a polyethylene based material.

If the greenhouse construction is wooden, its surface should be planed, and its sharp corners should be smoothed out and deburred.

Waste oil or oil-based agents should not be applied onto the wood. At high temperatures, wood expels resin, which in turns diminishes the life span of the greenhouse cover. For greenhouses with wood constructions, greenhouse covers with a life span of maximum 36 months should be used.

Greenhouse cover should be installed in the early morning, avoiding from high temperatures (recommended temperature range is between 15°C and 22°C), preferably in a windless time.

Agricultural films should be rolled out on a smooth and clean surface.

Greenhouse film should be properly stretched, without tensing excessively or leaving loose.

Agricultural films should never be contacted with any PVC piece.

Strap should be used in greenhouses for protection against the damaging effects of the wind.

In the event of an accidental tear or hole during the installation of the agricultural film, polyethylene based greenhouse repair tapes should be used.

One representative sample in dimensions of 50cmx50cm for each roll should be kept together with the product label.

Polyethylene based gauze produced for shading or shadow dust that does not contain any chemical or oil derivative that may damage to the greenhouse cover may be used for decreasing the permeability of direct light to the film.

Pesticides may ruin the linkage structure of agricultural films, thereby shortening their life span. Therefore, care should be taken to prevent the agricultural films to be exposed to pesticides.

After the application of any pesticide to the plants, the greenhouse should be ventilated.

Maximum amounts of sulphur and chlorine against which agricultural films may preserve their resistance are specified below.

Maximum Allowed Amounts of Sulphur and Chlorine

Life span of film	Sulphur		Chlorine	
	ppm/month	ppm / total	ppm/month	ppm / total
24 Months	31,3	750	3,13	75
36 Months	27,7	1000	2,77	100

Please see the optional features/chemical resistance section for any higher chemical resistance.

2. DEFINITION OF DEGRADATION

An agricultural film is considered degraded when its elongation strain decreases below 50% of its original elongation strain at the time of the production.

3. NOTIFICATION OF PREMATURE DEGRADATION

In the event of any premature degradation of the film, please notify Sera Plastic of the case via the dealer from which the film was purchased or through e-mail: sera@seraplastik.com.tr or phone number of 0 242 258 19 39 or fax number of 0 242 258 19 10. We will visit the site where the films are located to determine the cause of the problem. During the visit, you will be required to provide the following details of the film:

Type, width, thickness, weight and barcode number of the film and the dealer from which it was purchased. All these information are provided on the product label. Date of purchase, date of installation, crop, material of construction, date on which the degradation has begun, quantity of film that has degraded, two samples in dimensions of 50*50cm, one from degraded and one from unaffected part of the film, photo of the greenhouse and the degraded part of the film giving general view.

The samples are then sent to laboratory for testing. All expenses at this stage are on the account of Sera Plastik.

4. PREMATURE DEGRADATION

The actions from the notification of premature degradation are taken. In the event that a premature UV degradation that has occurred before the expiry of the warranted life span is determined, it is compensated in the manner described below. However, any degradation shall not be compensated if the harmful chemicals caused by the application of pesticides are found higher than the allowed amounts.

In the event of a premature degradation, an analysis is performed for chemical residues. If the analysis result shows a residual higher than the monthly or yearly allowed amounts, Sera Plastik shall not have any liability.

To decrease this harmful effect, sulphur and chlorine resistant films are produced upon request.

TS: Compensation Period (month) FS: Film Life Span (month) KS: Used Period (month)

TS=FS-KS

4.1. Resistant film shall be provided to the customer for a period equivalent to the unused period. In this case, the costs of the film and freight shall be on the account of Sera Plastik.

Example:

If a 36-month film degrades in 24 months, a greenhouse cover with a life span of 12 months is given on the basis of the following calculation:

TS=36-24=12

4.2. New product is given by applying a discount equivalent to the proportion of the unused period to the warranted life span. In this case, the freight is on the account of Sera Plastik.

Example:

If a 36-month film degrades in 24 months, a greenhouse cover with a life span of 36 months is given with a discount of 33% on the basis of the following calculation:

TS= FS-KS/FS*100

TS=36-24/36*100= 33%.

In both cases where repair is not possible, the user shall be obliged to return the faulty product to Sera Plastik within 15 days after the film is delivered to them for compensation purpose.

Retrospective complaints which may be raised after the expiry of the life span of the film shall not be taken into account.

Sera Plastik does not provide any warranty or shall have no responsibility for any replacement cost (material, labour costs, etc. incurred for replacement of the greenhouse film) or any loss of income, degradation of crop or any other consequential losses.

Liability under the warranty shall be limited to the amount paid for the film.

5. OPTIONAL FEATURES

Effectiveness periods of the features described in this section start with the production.

Amount of compensation that may arise out of any fault in the optional feature shall be limited to the amount paid for the option purchased.

5.1. Thermal (IR): Helps slower cooling of the greenhouse in night time, which has warmed by sun lights during the day. Minimizing the heat dissipation protects the crop against any risk of freezing which may be caused by any sudden decrease of temperature. Reducing the temperature difference between the day time and night time improves productivity. It decreases any stress on the plant and saves on heating costs of the greenhouse. IR effect increases with a thicker film. IR additive provides a temperature advantage up to +5°C, depending on the greenhouse construction, status of the wind, amount of moisture in the greenhouse and in the environment, irrigation regime and water retention capacity of the crop. Unless any special request provided otherwise, products with thermal (IR) additive are produced with the feature of Light Diffuser.

5.2. AntiDust (AT): This additive ensures that dust stuck onto the outer surface of the plastic can be easily removed with the help of wind and rain. Thus, light transmission of the greenhouse cover continues to be high for a long time, thereby increasing the efficiency.

5.3. Light Diffuser (LD): This additive ensures the sun rays to be refracted and diffused when they enter into the greenhouse. It thus prevents plants to create shadow for each other and protects the crop from the scorching effect of the sun in sunny times. It helps the growth of plants and fruits. Unless any special request provided otherwise, the light diffuser additive provides light diffused between 40% and 70%, depending on the film thickness.

5.4. AntiVirus(AV): This additive blinds the insects in the greenhouse such as whitefly and leaf beetle, thereby eliminating fungal growth or virus to spread. It increases efficiency, enhances the quality of the crop, and minimises the need for pesticide.

Antivirus shall be effective only when the film thickness is over 100 microns.

5.5. AntiFog-AntiDrip (AF): Transpiration occurs in the plants and soil because of the high temperature difference between the interior and exterior of greenhouses, and water drops are formed on the inner surface of the greenhouse cover. These water drops prevent some of the sun lights to enter the greenhouse. And the rest of sun lights entering into the greenhouse causes the plants to be scorched and ultimately some diseases because the water drops act as a lens. Antifog - Antidrip additive prevents humidity in the greenhouse to remain on the inner surface of the film as sizeable water drops. As this feature is included in only one surface of the greenhouse cover, attention should be paid to the warnings showing the direction of the film. Drops not remaining on the surface cause fog in the greenhouse. It is necessary to evacuate this fog layer. This process can be made by opening the sides of the greenhouse, through natural ventilation or by using fans. Fog not evacuated from the greenhouse for a long time may stick onto the plant or fruits, and cause diseases. Effectiveness period of the AntiDrip feature is up to 18 months, depending on the greenhouse construction, type of crop, irrigation regime, climatic conditions, internal and external humidity and heating conditions of the greenhouse. Any negative effect on such conditions may decrease the efficiency and shorten the effectiveness period of the additive.

5.6. AntiMist(AntMst): This additive helps alleviate the misting problem that occurs as a side effect of the greenhouse covers where AntiFog additive is used. AntiMist affects the efficiency and effectiveness period of AntiFog negatively and thus reduces the efficiency and shortens the effectiveness period of AntiFog.

5.7. Chemical Resistance (KD): This is an additive that ensures the greenhouse cover to be more resistant against sulphur and chlorine contained by the pesticides. Maximum amounts of sulphur and chlorine against which agricultural films with chemical resistance additive may preserve their resistance are specified below.

Maximum Allowed Amounts of Sulphur and Chlorine

Life span of film	Life span of film		Life span of film	
	ppm/month	ppm / total	ppm/month	ppm / total
24 months	62,5	1500	4,17	100
36 months	55,6	2000	4,17	150

6. EXCEPTIONS

Sera Plastik shall not have any liability for compensation or otherwise if any premature degradation is caused by any of the following reasons:

6.1. Excessive climatic movements. Hail, severe winds, hurricane, etc.

6.2. Accidents, disasters. Fire, flood, landslide, earthquake, etc.

6.3. External effects. Tearing, cutting and perforating, etc.

6.4. Finding the residual of sulphur/chlorine above the allowed amount on the film.

6.5. Failing to prepare the construction in compliance with the instructions stated in the section of construction application recommendations.

6.6. Failure to send the premature degradation notice at all or in due time and/or to provide conditions suitable for the inspections at the site.

6.7. Use of greenhouse cover with a life span longer than 36 months for greenhouses made of wood.

6.8. Any tear or wear not caused by UV degradation.

"Coextrüzyon teknolojisi ile üretilen"

9, 12, 24, 36,60

ay güneşe dayanıklı, kimyasallara dirençli,
UV Stabilizer, Thermal (IR), EVA,
Light Diffuser (ışık yayıcı), Antifog,
Antitoz, Antivirüs, Antimist, Cooling katkılı

Sera Örtüleri Solarizasyon, Malç ve Silaj Filmleri

İSTANBUL SERA® PLASTİK

Sera örtüsünde 1969'dan bugüne...



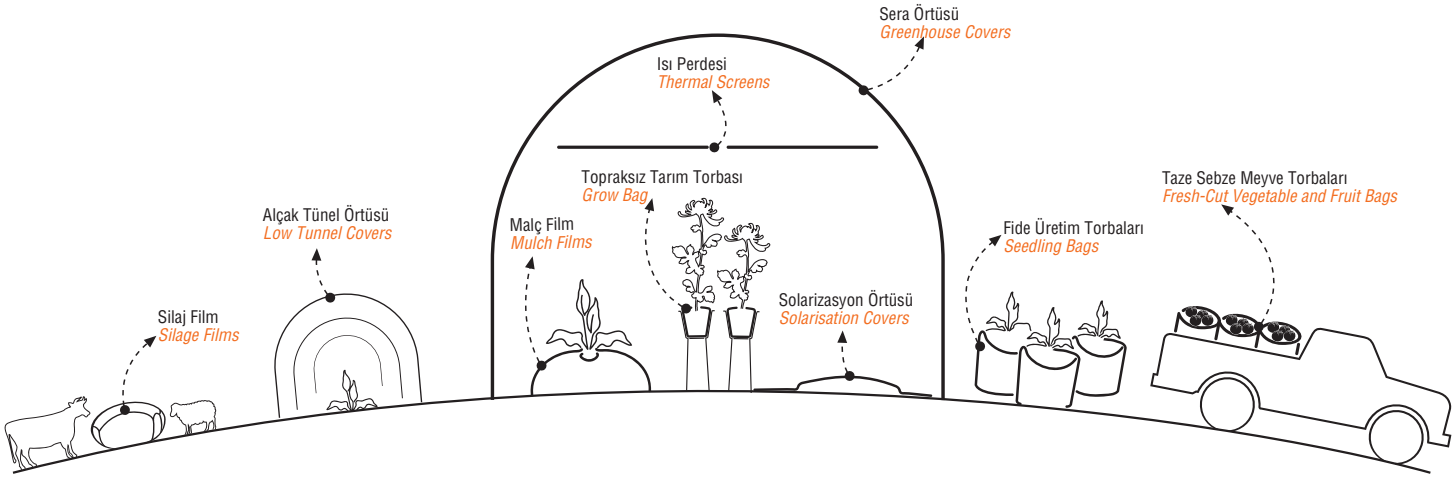

3 KATLI TARIMSAL FİLM

SERA PACK
Flexible Ambalaj

ISO 9001
JAS-ANZ

SERA®

hayatı kaplıyoruz



AGRI
TARIMSAL ÖRTÜLER

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