



## **FIXING THE PLASTIC TO GREENHOUSE STRUCTURE: THE RIGHT CHOICE**

The basic idea of greenhouse agriculture is to provide optimum growing conditions for the plant. Heavy investment is made in making strong greenhouse structures with an objective of fixing plastic cover on them which in turn should protect the plant from unfavorable conditions like rain, insects and diseases. While the farmers spend 90 % and above to make the structure it is not advisable to compromise on the quality of plastic and the way it is fixed to the structures. Selection of right kind of locking mechanism is the key to get the long life from the plastic covering. The following points must be kept in mind while selecting the locking options:

### ***OPTIONS USED IN LOCKING THE PLASTIC TO GREENHOUSE STRUCTURE METHODS:***

#### **1. PVC-MS ANGLE:**

This is an old method used in Indian greenhouse to fix the plastic. Normally MS angle is used as a base and PVC Gripper is slid on the MS Angle and locked with springs. On PVC Gripper. This is not a good system for the life of plastic for two reasons.

- a. The MS angle is normally painted with aluminum paint which uses organic solvent as thinner and it is oil based. It reacts with Polyethylene film and breaks it down at the contact point.
- b. The MS angle tends to rust due to high humidity inside the greenhouse. It gets rusted fast. The rusted angle heats the plastic in the day time and cools it in the night. The alternative heating and cooling tends to crack the plastic as shown in the picture below. It is extremely important for this reason not to have any part inside greenhouse made of mild steel that comes in direct contact with plastic.



### **Damage of Plastic due to Rusting contact point**

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## c. GI Profile and Spring:

Recently GI profile is a popular choice of many greenhouse suppliers in India due to its low initial cost. The internationally approved zinc coating for any greenhouse component is 275 grams per sq. M. There are two kinds of GI profile available in the market.

### a. Locally formed GI Profile from a pre galvanized GI sheet:

The shape of this kind of profile is not proper to support the plastic for longer life. The thickness of material is ranging between 0.6 mm to 0.8 mm. Pre-galvanized sheets are normally of 120 GSM zinc coated which is not enough for it to last long without being rusted. It also has sharp edges. It tends to open up during strong wind.

### b. Cold rolled formed imported from China :

Shape of this profile looks much better since it is produced on cold rolled formation mills. Thickness again ranges from 0.6 mm to 0.8 mm but the zinc coating is only about 80 GSM.

Both kind of GI profiles are not recommended for a longer life of plastic due to following reasons:

- GI Profiles rusts due to high humidity and water getting stuck in the profile. GI absorbs more heat compared to Aluminum and after some time and due to alternative heating and cooling the plastic cracks.
- It has limited life compared to aluminum.
- Initial cost low but cost per year of life of greenhouse works out much more.
- High maintenance.

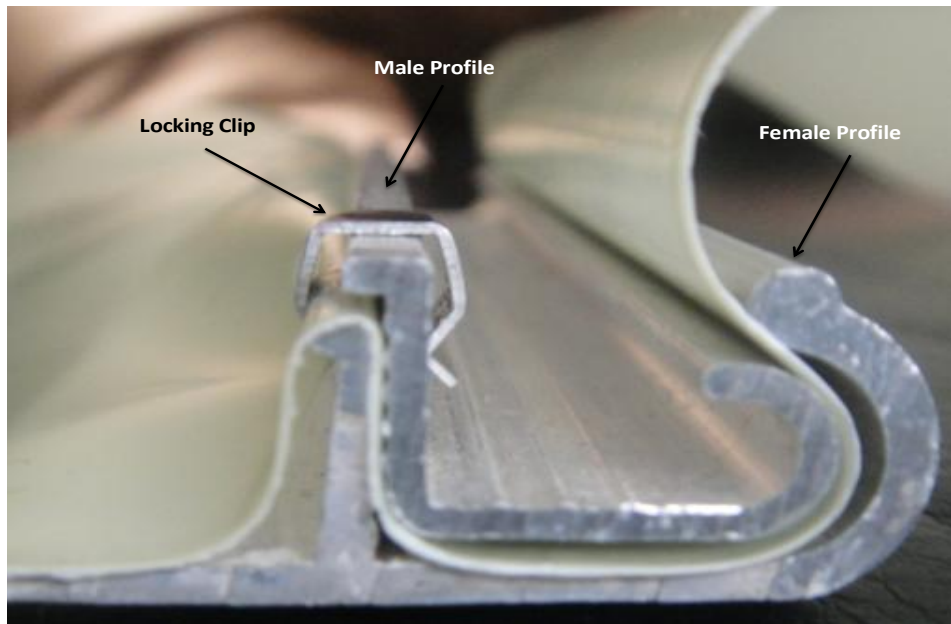
## 2. ALUMINIUM PROFILES:

### A. Aluminum and Aluminium:

This kind of profile is mostly used in imported greenhouses. There is a male and female components of the profile. The plastic is sandwiched between the two like the picture as follows a locking clip is used to keep the profile from opening up. There has been complaints of plastic tear in this kind of profile and also it is more expensive due to the extra weight of aluminum.

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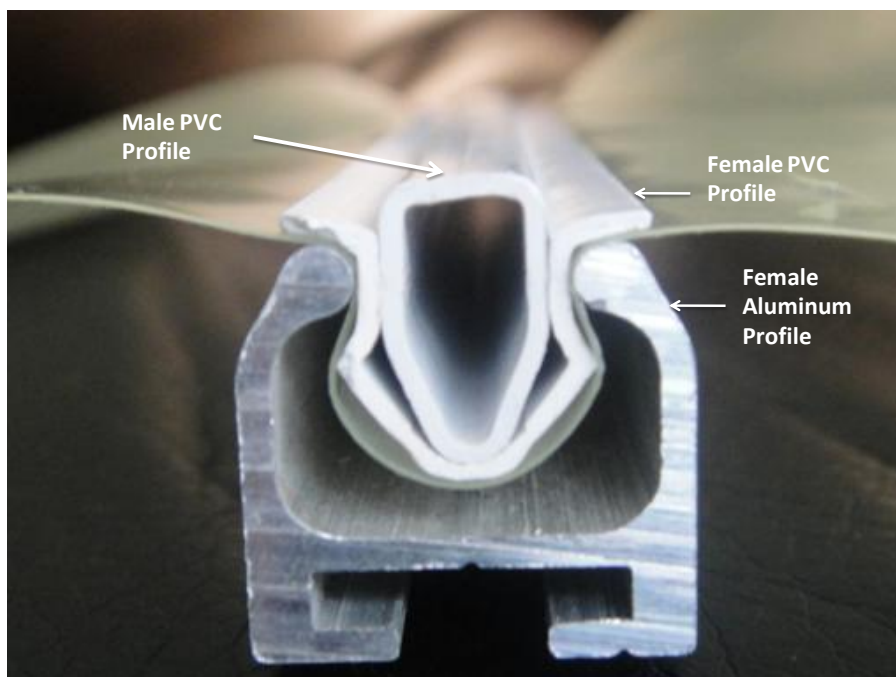
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**PICTURE OF ALUMINUM ALUMINUM LOCKING PROFILE**

## **B. Aluminum and PVC:**

This profile is also mostly used in imported greenhouses. There is a male component made of PVC and there are two female component one of PVC and another of aluminum. The plastic is sandwiched between aluminum and PVC female profile and then the locking PVC profile is pushed in the female PVC profile to keep the plastic in place. This profile is also expensive due to two types of PVC lockers and also this needs to be changed from time to time. This kind of profile is used mostly at the gable ends and corners of the greenhouses. This is not very popular among Indian Manufacturers.



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## C. Aluminum and Spring :

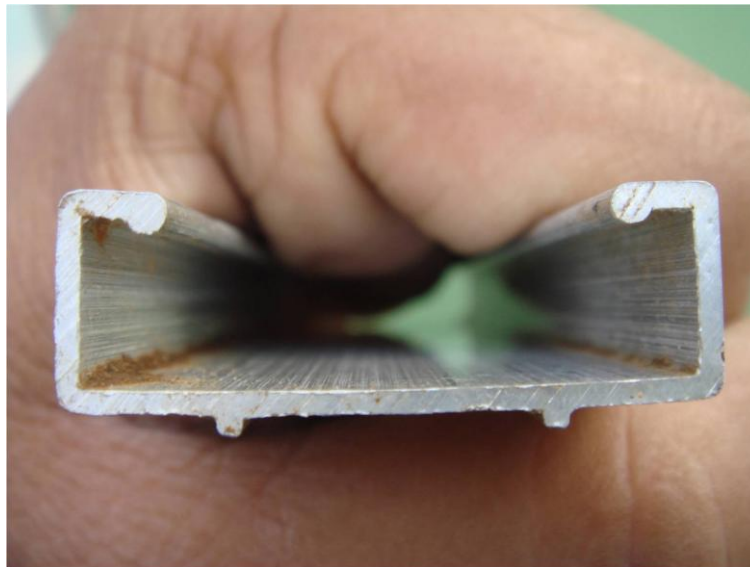
Spring and channel method is the most popular and economical method of fixing plastic film to the structure. There are some important points while selection this kind of locking mechanism:

1. Edge of the profile must be smooth and not sharp. A sharp edge of aluminum profile will cut the plastic like a blade and farmer ends up losing sheet prematurely.



**Damaged Plastic in a new greenhouse due to sharp profile**

2. There should be well defined channel in the profile to rest the locking spring. This stops the movement of spring in strong wind and does not allow the plastic and spring to rub against the wall of the profile.



**Aluminum Profile with well rounded edges but not well defined channels for spring.**

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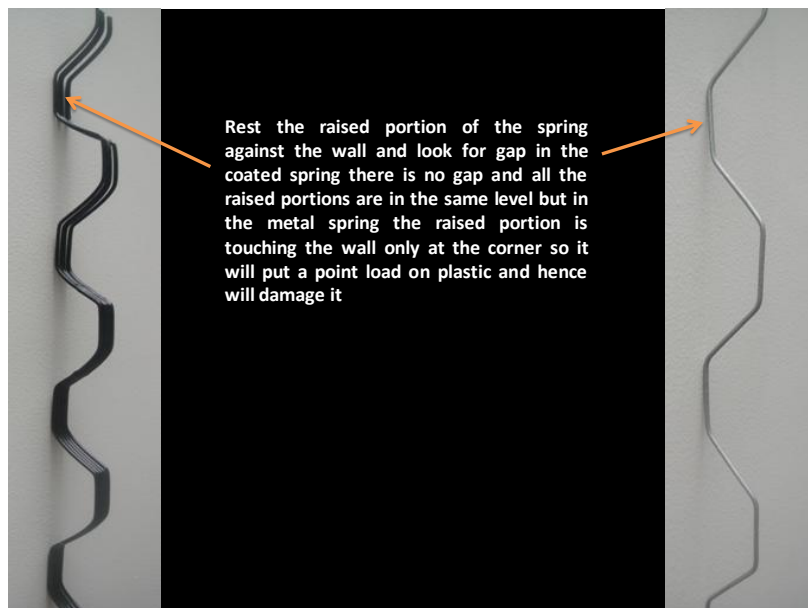


3. A coated spring is preferable compared to cold galvanized spring as a coated spring transfer less heat to the plastic and thus enhances the life of the plastic.



**Aluminum Profile with well rounded edges and also well defined channel for coated spring is the best for locking the film**

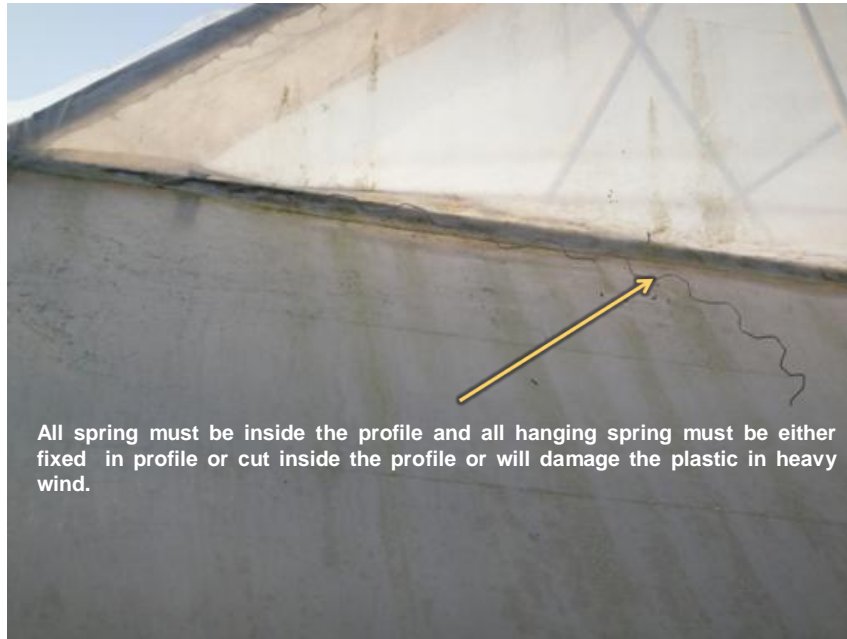
4. The alignment of the spring should be perfect. To check the alignment one can perform a simple test on the spring. Keep about 4 full length of spring against the wall. If all the raised part on one side of spring touches the wall surface evenly it is a good spring. If the raised portions are touching wall only on the corners the spring will damage the plastic as it will give only point load.



5. If you are using GI spring it is better to use a two inch strip of new poly film to be placed over the main plastic in the profile and then lock it with GI profile. This will help in longer life of the plastic as the rusted spring will not directly come in contact with the main plastic.
6. Self Drilling Screw should be fixed on profile every 40 cm along the full length of the profile.
7. All spring must end inside the profile. Any spring outside profile must be either fixed inside or should be cut so that it does not damage the plastic in strong wind as it will initiate all the plastic being pulled out of profile.

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All spring must be inside the profile and all hanging spring must be either fixed in profile or cut inside the profile or will damage the plastic in heavy wind.

A special precaution is to be taken while using a coated spring. Please note that a coated spring is more slippery than a metal spring and while using a coated spring last half meter of all the places where profile is ending one must use cross locking double spring like the picture below:



### Precaution while using a coated spring

### 3. Wood:

Is mostly used in imported greenhouses to reduce the cost compared to Aluminum profile. Wood is a poor conductor of heat and does not damage plastic adversely. It has limited life and needs maintenance during the change of plastic hence it is not a popular choice among Indian Growers and greenhouse manufacturers.

It is very important to pay extreme care in selecting a proper locking mechanism for getting the longer life from the plastic.

**Always keep in mind "We are not rich enough to use cheap products".**

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